

THE  
MEDICAL REPOSITORY.

VOL. II.—No. II.

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1798.


# MEDICAL REPOSITORY

AND ARTS JOURNAL

FOR THE YEAR 1841

NEW YORK

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## ADVERTISEMENT.

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**T**HE long delay of this number has arisen from causes which must be obvious to every reader. The derangement and suspension of the printing, during the late epidemic, rendered it necessary to execute the principal part of the work a considerable time after the period at which it ought, according to the order prescribed, to have been ready for publication. The pressure of so great a calamity will doubtless induce the friends and patrons of the Repository indulgently to consider this inevitable deviation from the punctuality hitherto observed, with little exception.

The resumption of our editorial duties, since the extinguishment of the epidemic, has served at every step powerfully to recal our sympathy for the loss sustained by this work in the death of our excellent colleague and friend Dr. SMITH. The weight of this loss will be duly appreciated by all those who honour the REPOSITORY with their perusal.

Instead of sinking, however, under the weight of a misfortune in which the whole medical world have reason to participate, the surviving Editors find themselves impelled, by the most cogent motives, to redouble their exertions in supporting and improving this publication: And they pledge themselves to the public to spare no labour or pains to deserve a continuance and extension of that patronage which has hitherto fostered the undertaking, and greatly exceeded their expectations.

The situation of the United States, in relation to the recurrence of the malignant epidemic which has proved so fatal for some years past, is critical and alarming. It is to be hoped every exertion will be made to collect the information upon which public opinion is ultimately to be formed, and the proper measures adopted for guarding against the return of the disease. In conducting this work, nothing can give the Editors more satisfaction

than to be instrumental in assisting and promoting this great object of public safety; and they respectfully request readers of every description, who have had opportunities to observe the origin, phenomena and causes of pestilential diseases, to collect and arrange all such facts as may be deemed interesting, and, when more eligible channels of publication do not present, to suffer them to be laid before the public through the medium of the *Medical Repository*.

Communications designed for this work, may be addressed (post paid) to either of the subscribers,

SAMUEL L. MITCHILL, *Columbia College.*

EDWARD MILLER, No. 158 *Broadway.*

New-York, December 15, 1798.

*N. B.* In order to facilitate conveyance, and to save expence, persons wishing to transmit communications for the *Medical Repository* from distant parts of the United States, may send them, if deemed more convenient, addressed to the care of T. and J. Swords, No. 99 Pearl-street, New-York; E. Larkin, Boston; T. Dobson, Philadelphia; A. Hannah, Norfolk, Virginia; Freneau and Paine, Charleston, South-Carolina; and Seymour and Woolhopter, Savannah, Georgia.

*The following errors have passed in some of the copies of this Number :*

Page 163, line 8 of Dr. Priestley's letter, for "atmosphere" read *atmospheric*.

165, line 17, for "absorbed" read *ascribed*.

—, in the last line of the last paragraph but one, before the word "may" insert *air*.

167, line 8, for "*ponderera*" read *ponderosa*.



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# MEDICAL REPOSITORY.

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Vol. II.—No. II.

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## ARTICLE I.

*On the febrifuge Virtues of LIME, MAGNESIA and ALKALINE SALTS in Dysentery, Yellow-Fever and Scarlatina Anginosa. In a Letter from Dr. JEREMIAH BARKER, of Portland, (Maine) dated May 30, 1798.*

I HAVE perused your letter to Dr. Percival with particular attention, as well as the other books, and acknowledge myself to be furnished with many new as well as very important ideas. Several of my brethren have also read them, and are persuaded of the truth of the doctrine. But there are some among us who still consider the phenomena of fever to depend upon a redundant quantity or acrid quality of the bile. Therefore their views are chiefly directed to emptying the intestines of this *mischievous liquor*, as they term it. Of what importance is it then that "medical prejudices should be combated, and a new order of things established?" "If Professor Mitchill should succeed in discovering the quality of contagion," says a learned member of the Massachusetts Medical and Philosophical Society, in a letter of May, 1797, "it might occasion a great revolution in the practice of medicine."

For nine months past epidemic fevers have been very prevalent in this northern climate, lat.  $43^{\circ} 43'$ , and attended with considerable mortality. Having been pretty constantly engaged in practice, I have had an opportunity of making accurate observations, and have been very particular in noting them.

A general account of these distempers, as they have appeared among us, together with the mode of practice which has been pursued, I presume, may not be unacceptable.

The weather during the month of July last was very dry and sultry. The month of August was remarkably wet and drizzly; the grain much damaged by mildew and rust.

*Vol. II. No. 2.*

B

From the middle of August to the first of October an epidemic fever, attended with dysentery, was very prevalent in several towns. Adults were more generally seized with it than children.

The disease was ushered in with pain in the abdomen, frequent stools, nausea or vomiting, chilliness succeeded by heat, and great prostration of strength. The stools were deeply tinged with blood, and very fetid. The matter rejected from the stomach was of a dark green colour; its taste described to be like that of tartar emetic. A considerable fever and thirst constantly attended. The pulse was quick and weak, though, during the exacerbation, which happened about once in twelve hours, large and full. The violence of the disease continued from one to two weeks, according to means used for its melioration. Thirty severe cases, besides several gentle ones, fell to my share. I lost only one adult, to whom I was called at a late period, and two children, where very little medicine could be administered. The mode of practice which I pursued was to cleanse the stomach with ipecac. and the intestines with rhei and sal. absynth. or sal. cathar. with sal. absynth. Lubricous oils and mucilages were occasionally employed, as also enemas. But the remedies which I depended upon to counteract the noxious cause, were alkaline salts and earths. My common prescription was aq. calc. ℥j. sal. absynth. ʒij. the dose from one to two ounces every hour, and in some cases every half hour, or oftener, in an infusion of flor. chamœm. Besides this I used testamagnes. or creta, frequently from one to two ounces in twenty-four hours. Calcined oyster-shells were sometimes employed, from ʒij. to ʒi. the dose.

The adult fatal case was a woman of twenty, ten days advanced in the disease before alkalines were employed. The other remedies had been duly administered, together with opiates, but to no apparent benefit. For three days she had rejected every thing from her stomach that was taken, together with dark green bile. The stools resembled grumous blood, and were *remarkably* fetid. The pain in her bowels, with a sense of heat, was very distressing; thirst for water intense. A table-spoonful of the alkaline solution was then given once in a quarter of an hour, and the vomiting readily ceased. She requested it oftener, without any additional mixture, saying that it was very grateful to her stomach, and served to remove that disagreeable taste from the mouth and throat. The stools also abated in frequency, and assumed a more natural colour; but, to the astonishment of her nurse, the factor was almost entirely removed in less than eighteen hours. The next day, being in every respect apparently better, she asked for food, which she had not done before since the attack. She was indulged freely by her nurse, and the medicine omitted, supposing it had done its office, and food only indicated. She failed the day following, under oppression about the precordia and cold sweats.

I had many other cases very similar, and equally alarming, but had the happiness to see them all recover, under a liberal use of alkaline remedies, confining the patient chiefly to a diet of boiled rice and Indian gruel. I had an opportunity of observing that where wine, cinnamon, or other cordials were disrelished and nauseating, which was generally the case, pure lime-water was not only congenial to the stomach, but peculiarly grateful to the taste. I found that an aqueous solution of alkaline salts was equally congenial to the stomach. These articles evidently abated that sense of heat in the stomach, and thirst for water, so generally complained of.

During the month of October the epidemic fever continued to prevail, unattended with dysentery. The symptoms in other respects were not dissimilar, excepting that some were attended with a deep yellow skin, and all with more or less pain in the head and back.

Five of my patients, with a yellow skin, resided in a country village, near a fresh river, on low marshy ground, seven miles from Portland, so that no suspicion was entertained of the disease being imported. Several other cases of yellow-fever occurred in different parts of the country. A woman, seven months advanced in pregnancy, was attacked with this species of fever. I was called the sixth day. She lay in a comatose state, and could not be roused. The skin was of a deep yellow colour, though her face was suffused with redness; the pulse was full, and the bowels constipated. She was attacked, as I was informed, with nausea and vomiting, pain in the head and faintness. I took away eight ounces of blood, and gave a cathartic, which did not operate. The next day an abortion took place, and she died a few hours after.

Another woman was attacked in a very similar manner in her ninth month. She was delivered in the midst of her fever, and recovered upon the alkaline plan. All the other patients also recovered that were attended with yellowness, excepting the case first mentioned, and alkaline remedies evidently afforded the most relief. They would actually alleviate the distressing pain and anguish at the stomach, which would not yield to opiates. The morbid excitement, too, was *evidently* under the controul of alkalines; the febrile disturbance appearing to be in a direct *ratio* to the degree of virulence in the deleterious cause.

This fever generally subsided in ten or twelve days, where alkaline remedies were employed; but where they were not used, it was frequently protracted to twenty, and sometimes thirty or more days, and then they seldom recovered.

A merchant in the country village above mentioned was attacked with the prevailing fever, though his skin was not yellow.

Due attention was paid to him in the usual way, for alkalines were considered, by his friends, as dangerous articles. He continued thirty-six days, and died highly putrid. His nurse, before he died, was attacked with the fever, and expired on the twentieth; livid spots appearing upon her body immediately after death.

A servant man was also attacked with similar complaints, and died on the eighteenth, under similar treatment. of

Immediately after the death of the nurse, who was removed to her father's family, in the neighbourhood, consisting of eight children from eighteen to six years old, three of these were attacked with the prevailing fever. Alkaline remedies were employed in these cases, though at a late period of the disease, when two were judged to be hopeless; but they happily recovered. The other five were then attacked in a similar manner. Their symptoms, at the onset, were truly alarming; they all, however, recovered under a liberal use of alkaline remedies, with very few medicines of any other kind.

Vomiting of green matter, with an occasional diarrhoea, were the most troublesome symptoms in the case of the nurse, which could not be mitigated by evacuants or tonics; but all the symptoms of disturbance in the others gradually subsided after the first week, without any evident symptoms of putrescency taking place. The recovery of these patients served, more fully, to establish the credit of a mode of practice, which had been judged by some to border upon rashness, viz. exhibiting alkaline salts and lime-water in fevers.\* During the months of November, December, January, February, and March, the fever, which still continued, was attended, in most cases, with a scarlet efflorescence and sore throat. It prevailed in almost every town in the county, and was mortal in many instances.

The disease was ushered in with the usual symptoms of nausea or vomiting, chilly fits, succeeded by heat, &c. The throat soon became inflamed, which, in a short time, put on a gangrenous hue, and the breath was very foetid. In some cases the throat was swelled to such a degree, both externally and internally, that deglutition and speech were almost entirely prevented; but there was no uniformity in the symptoms. In some there was no sore throat or eruption. In three cases, which I saw, the virus was turned upon the renal glands, producing bloody urine, mixed with skinny filaments, attended with great pain, heat and anguish. In others there was distressing pain in the bowels and thirst for water.

\* The saline mixture and spt. mind. have ever been considered as safe and efficacious medicines in fevers; but we never suspected their efficacy depended upon any alkaline power that was exerted after saturation, and our ignorance in this respect, I presume, is not very singular.

After cleansing the stomach and intestines, my efforts were particularly directed to counteract the virus or noxious cause. To effectuate this important purpose, alkaline remedies were liberally employed, and their good effects were very apparent.

Besides these, oils and mucilages were used to advantage. The mouth and throat, when particularly affected, were gargled with lime-water. This was evidently beneficial. It was as congenial to the ulcers and sores as it is to ulcerations upon the external surface. Epispastics were applied to the neck, with a view to unload the glands of accumulated poison. The blisters produced a great discharge, and were very sore, attended, in many instances, with intolerable itching. A lotion of lime-water readily allayed this itching, and disposed the sores to heal, which, in some cases, appeared gangrenous.

I was called to two cases which terminated fatally. These were all that I lost out of more than fifty in this distemper.

In one of the fatal cases, a girl of twelve; to whom I was called the sixth day, the throat was gangrenous; the arm also became gangrenous where an epispastic had been applied; the breath was extremely foetid, and her speech and swallowing were in a great measure prevented. She died the twelfth. The other, a child of four, complained of a distressing pain in the bowels, and was very thirsty. The efflorescence, which had been slight, readily disappeared, and the throat was not affected.

Warm stimulating teas, evacuants and tonics, particularly opiates, had been given, but no ease could be procured. I saw her on the eighth day, and she died the ninth. Upon dissection, the inside of the stomach was found red and inflamed; the texture of the villous membrane destroyed, grumous blood appearing in its stead. A black liquor was also contained in the stomach, which was in a contracted state. No marks of inflammation appeared in the intestines; they contained a yellowish fluid, and were distended with air. The omentum was considerably wasted, and of a red colour. No other morbid affection could be discovered.

Another child in the family, a girl of six, was, soon after, attacked in a similar manner. I was called the fourth day, when the efflorescence, which was partial and light, had vanished. The pain and anguish in her bowels appeared, by the complaints, equally distressing, and her thirst for water was great. After gently cleansing the stomach and intestines, the alkaline solution soon alleviated her distress, and, contrary to my expectation, she recovered.

I dissected a woman, some years since, who died of a puerperal fever, and found the stomach in a very similar condition with the child inspected. I saw another puerperal case dissected, where the rectum was also corroded and partly destroyed. I then accus-



ed the bile of being the mischievous cause; but I now believe that the ravages made in the stomach, intestines, throat, or other parts, must be imputed to the *septic acid*; and am fully persuaded that a seasonable and liberal use of *alkalines*, in all these different species of fever, are especially indicated. Indeed, I conceive of no other medicines that can, with any measurable degree of propriety, be denominated *febrifuges*.

For nearly three years I have pursued this mode of practice in febrile diseases, and have kept exact records of cases; from which it appears that I have not lost a single patient, where these remedies have been particularly employed from the commencement of the fever.

I found that opium and spirits could be borne only in very small quantities in these fevers, especially in the first stage; and when the morbid excitement was considerable, they were evidently injurious. Wine was offensive to most stomachs; and the bark was by no means congenial. Mild-bitters in decoction were generally agreeable. Rice and Indian gruel were the most grateful articles of diet.

I hope, before long, to assume confidence enough to publish a particular account of these febrile distempers, as they have appeared among us for a few years past, together with such observations as appear to me of public utility; and if it should, in any measure, contribute to promote the art of healing, I presume you would be compensated for your friendly assistance.

With sentiments of great esteem and respect,

I am, dear Sir,

Your much obliged humble servant,

JEREMIAH BARKER.

Dr. S. L. MITCHILL.





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 ARTICLE II.
 

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*An Account of the PESTILENTIAL FEVER which prevailed at WILMINGTON, North-Carolina, in 1796; in a Letter to Dr. MILLER.*

By A. J. DE ROSSET, M. D.

I REGRET that it is not in my power to furnish you with as accurate an account as I could wish of the epidemic of 1796, not having kept any record of the disease, or any diary of the weather; neither have I been able to procure them from any of my medical friends. To shew, however, my readiness to comply with your request, I will endeavour to supply those deficiencies from memory.

The spring and early part of the summer of that year had been remarkably wet, scarce a day having passed for several weeks without rain. About the middle of the summer the weather became dry, and unusually warm. In July the dysentery appeared, and soon became very general, proving fatal in many instances. Toward the close of August, when the first cases of the bilious fever occurred to me, the dysentery began to decline; and scarcely one new case of it occurred after the fever became more prevalent. It may be here remarked, that every person who had laboured under the dysentery, without an exception, within my knowledge, escaped the fever. No age, sex, or colour was exempt from its attack. On or about the 20th of September, succeeding several very warm days, we had one day so cold that a surtout was to me a comfortable addition to my clothing. On that day more persons were taken ill than on any two other days during the sickness.

The symptoms which ushered in this disease were chilliness and rigor, alternating with a sense of heat; pains in the head, back, loins, and extremities; faintness and vertigo; difficult respiration, with a tightness across the chest; oppression at the præcordia; a pain in the hypochondria and region of the stomach, which scarcely admitted the slightest pressure; anxiety and depression of spirits: early in the disease the neck and face were flushed; heat and redness of the eyes: after a few days continuance, the eyes and skin became yellow, observable first upon the upper part of the breast; the pulse, in most instances, quick and full, though not hard, becoming in two or three days small and weak. In several cases, the pulse, in a couple of days from the attack, became perfectly regular, both with respect to strength and fre-

quency, and differed nothing that I could discover from its healthy standard, while the other symptoms continued as before, or were aggravated; so that the danger of the patient was not indicated by the state of the circulation. These cases terminated fatally. Nausea and retchings to vomit were almost inseparable from this fever; sometimes nothing was discharged by these efforts, but generally a yellow bile, changing by degrees to a greasy looking green water, which was, however, often thrown up without any conatus, but by a kind of gulping, or involuntary eructation: ultimately the true black vomit, as described by writers on the yellow fever, came on. A number of other symptoms, by no means peculiar to this epidemic, took place; such as great thirst, dry parched tongue, dry skin, paucity of urine, and that apparently much coloured with bile, bound belly, &c.

The opinions of people here have differed as much relative to the origin of this fever, as those of the Philadelphians, respecting their epidemic of 1793. I have, however, no doubt in my own mind of its having originated among us; nay more, of its differing from our common autumnal bilious remittent but in degree, of its originating from the same causes, and being aggravated by the circumstance of season. The situation of our town, exposing much to the operation of marsh miasmata, the state of the weather which preceded and accompanied the disease, our not being able to trace it to any other source, all tend to a confirmation of this opinion. I did not observe one unequivocal instance of its being communicated by contagion, nor do I believe that with us it was so; though I have no doubt that diseases originating from miasmata may become highly contagious, from particular circumstances. A few cases every year of our common fall fever, take on all the symptoms of a violent yellow fever; and, in the year 1796, many cases of the epidemic were without those symptoms which peculiarly characterize it, and differed in nothing from the common autumnal fever.

With respect to the remedies used in this disease, I shall only mention those differences from the common practice which were rendered necessary by the circumstances of the disease. Blood-letting, from the sudden prostration of strength which succeeded it, we could not make use of as a general remedy: nor durst I venture upon the use of antimony, or indeed any emetic, from the very irritable state of the stomach: many to whom medicines of this kind had been exhibited, without professional advice, vomited incessantly till they died. I generally endeavoured to evacuate the bowels freely, by the use of purges, assisting their operation by glisters; after which, without waiting for an intermission, I attempted the use of some light preparation of the bark, which, when it could be retained, seldom failed proving service-

able. If a moisture on the skin was the consequence of its exhibition, I considered my patient safe. In the early stage of the disease, bark and opium, even where they did not aggravate the symptoms, were productive of no advantage. With a view to procure remissions, the common febrifuge saline draughts and mixtures were prescribed, and were sometimes serviceable, as well as the various acidulous and small drinks usually furnished the sick in such cases.

Thus, Sir, I have, as far as I am able, given you an account of the disease which you requested, and hope no material information has escaped me. You will be good enough to make every allowance which may be necessary, and remember that I have written solely from memory.

I am, with much esteem and respect,

Yours,

A. J. DE ROSSET.

P. S. The number of deaths, including those from the dysentery, amounted, in that year, from the beginning of August to the beginning of November, to about one hundred and fifty persons of all descriptions. The 25th and 26th days of September were more fatal than any others. On one of those days as many as fourteen funerals were counted—A very large number for a small place not containing more than one hundred and twenty, or one hundred and thirty families.



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 ARTICLE III.
 

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*On the ill Effects of Blood-letting in PUTRID BILIOUS FEVERS and PNEUMONIA TYPHOIDES, as they appear in North-Carolina; in a Letter to Dr. DAVID HOSACK.*

By HUGH WILLIAMSON, M. D. &c.

SIR,

**E**XERCISED as I have been for many years in public employments, and desirous to supply by industry, what might be wanting in talents, I have devoted little time, as you may believe, to medical studies. In the mean while, the diseases that are most fatal in Carolina, have not failed to claim some share of my attention; but the few cases that have accidentally come under my notice, have not enabled me to determine what is the best method of treating them, much less can I say, whether the lancet is successfully used in treating the Yellow Fever; for I have not seen a single instance of the complaint that is properly so called in North-Carolina. The fevers with us, of a bilious origin, that are most fatal, do not commonly appear in the warmest season. Those fevers, as I conceive, are not removed by a liberal use of the lancet.

Bilious intermitting fevers are very prevalent during the autumn, in the level country near the sea coast. They also prevail near the rivers, for some distance above the low lands. Those fevers are seldom fatal except to strangers who have a tense fibre, or who are careless. Those intermitting fevers disappear as the cold weather sets in; but they are frequently succeeded by fevers of a different type that are more fatal. Those fevers of the colder season, are commonly attended by symptoms of partial inflammation, whence they are denominated *pleurisies of the eye or the head*; at other times they affect the side. In those several forms they are equally dangerous. As those symptoms of pain are attended with a considerable, often with a high degree of fever, the general practice has been to bleed once and again; but the patients, by far the greater part of them, as I conceive, sink under the disease.

From a detail of circumstances, I have been induced to believe that the fever mentioned is of the putrid kind. It commonly attacks people who have been afflicted by intermitting fevers, during the summer and autumn. It appears chiefly, perhaps only, in those

places where people are subject to intermitting fevers, in low sunken grounds, and along the sides of rivers. In the beginning of the winter, in the year 1792, that fever was very fatal in Martin County, near the river Roanoke; the river had lately been very low, and much of the muddy bottom, and other grounds usually covered by water, had been exposed to the sun. The pain was then in the head. In the year 1794, ten or twelve men, the heads of families, adjoining one another, died of that complaint in December, on the river Neus. They had lived near the beginning of the high grounds on the north-east side of the river. There had been a dry season, and the winds commonly at southwest. The other inhabitants of the adjacent country, except on that narrow strip by the river, enjoyed good health.

In the year 1792, to the best of my recollection, in the beginning of winter, this pleurisy in the head, as it was called, was endemic near Matamusket, in a settlement where the land is rich but very low, and much of it covered with water. There was only one practitioner in physic in the settlement, and he was a mere empirick. We have little intercourse with people in that settlement, for they are surrounded by an impenetrable dismal, or a broad sound. Inquiring of a planter from that settlement concerning their population and general state of health, he told me that thirty or forty of the inhabitants had died on the foregoing winter of a *pleurisy in the head*. Have you no Doctor? Yes, said he, we have one. Did he not bleed his patients? He bled them frequently. Did any of these patients die? They all died. Did not you try in that case to do without the Doctor? Yes, said he, we left off sending for the Doctor; we drank our own teas, and people recovered.

I had been told by a very respectable Physician, that he was called, in the course of his practice, to see a Negro, in Jamaica, sick of a pleurisy. He had a sharp pain in the side, attended with a fever. The patient was bled, and died in two days. He was soon called to see two or three other slaves on the same estate ill of the same complaint. He ordered them to be bled, and they all died. Alarmed by this unexpected issue of his practice, he began to look for the cause of a complaint that eluded the lancet, and he discovered a pond of stagnant water to the windward of the huts of the Negroes. The lancet was thrown aside, and, by the plentiful use of cordials, the sickness among those people was removed.

Facts of this kind have tended to establish the opinion I have mentioned concerning the fever that is commonly so fatal in North-Carolina.

Two cases only have occurred in which I had an opportunity of comparing this theory with the corresponding practice.



While the assembly was sitting at Raleigh, in January, 1795, one of the members, who lodged at my quarters, was taken sick of a fever and pain in the side. One of the members had lately died of a similar complaint in three or four days illness; and the persons above mentioned on the river Neus, at no great distance, had died on the last month of a pain that was also in the side. The member last taken ill was from the Pais Bas, and had been sickly in the autumn. The Doctor who was called requested my advice. I advised him to keep the lancet in his pocket; but as the patient complained of a head-ache, a full pulse, and redness in his eyes, a moderate dose of castor oil was administered. The operation was moderate; but the consequent loss of strength in the patient, and depression in his pulse, was more than I had expected. A blister was put on his legs. He drank wine whey plentifully, and took an infusion of *serp. virg.* and *cort. peruv.* not very liberally, for he preferred the whey or the wine. He recovered.

A gentleman of my acquaintance at Edenton, was seized that winter of the same fever. Sundry persons in that town, or its vicinity, had lately died of it. They had been bled as for the common pleurisy, an inflammatory disease. The pain on that winter uniformly affected the side. The gentleman to whom I refer was taken ill in the night: he was bled by a Doctor who was called early in the morning. I saw him before ten, and advised to abstain from the further use of the lancet. The patient was a strong man; but he also had been afflicted in the autumn by an intermitting fever. I wished to see a remission of the fever before the bark was administered. A sufficient perspiration was easily excited. He was twice blistered. He drank wine whey plentifully and snake-root tea. On the fourth or fifth day he discharged a little blood, mixed with phlegm, from his lungs. Passing that appearance to the account of a dissolved state of the fluids, I did not hesitate to advise a plentiful use of a cold infusion of the bark. He recovered. I did not hear, to my recollection, a single case that winter of a patient recovering who had been freely bled.

As the patients who suffer by the complaint are commonly men, not often women, and as men expose themselves much more imprudently than women to the cold and to the rain, there is reason to believe that a checked perspiration is the proximate cause of the complaint. Any fever, thus induced, where the fluids are dissolved, and in such a state of the atmosphere as has been mentioned, must soon be expected to put on a dangerous appearance. I have known a man, thus prepared by intermittents, in the season and country mentioned, bring on, by dancing, what was called a pleurisy in his head, and die in forty-eight hours.



I was assured by Dr. Sawyer, a Physician in Pasquetank, about thirty miles from Edenton, that he was called to many patients on the winter of which I have last been speaking. They complained of a pain in the side and a high fever. He seldom waited, as he declared, even for a remission: he gave the bark in substance, and his patients recovered. Having business in Pasquetank, I inquired concerning the general progress of that fever during that sickly season. I was assured, by a gentleman there, whom Dr. Sawyer had attended, that having a high fever and considerable pain, he took the bark in substance, and thought that his fever moderated by every dose. He said that one of his slaves had been treated in the same manner with a similar effect. He added, that another Physician in the same vicinity, a man of talents, and well educated, adhering to the bleeding system while the pain and fever remained, had lost the most of his patients.

Whatever success may have attended the practice mentioned, I think the indiscriminate and immediate use of the bark must be exceptionable and hazardous. I am, nevertheless, persuaded, by all the observations I have made on this subject, that the lancet should seldom be used in the brumal fevers, that often appear in the low country in Carolina; but it is a remedy commonly at hand; it promises immediate relief to a person in pain. These circumstances appear to have kept it too long in use.

Be pleased to accept the assurance of my sincere respect.

HUGH WILLIAMSON.

*New-York, August 25th, 1797.*



## ARTICLE IV.

*Singular Termination of an OMENTAL HERNIA; communicated in a Letter to Dr. MITCHILL, by Dr. JAMES STRATTON, of Swedesburgh, New-Jersey, dated July 2, 1798.*

ON the 26th of April, 1795, W. C. of the county of Salem, in New-Jersey, aged 45, of a firm constitution, was attacked with a violent cholic. On the 28th his bowels were freely opened, and some relief was obtained by injections. 30th. The bowels continued open, but very uneasy; a hickup, or a kind of belching, was observed, which frequently brought up a part of the contents of the stomach. On inquiry a tumor was found in the right groin, of about the size of two fingers, owing to the protrusion of a portion of the omentum, through the ring in the abdominal muscles, forming an omental hernia. After plentiful bleeding, attempts were made to reduce the protruded part, but without effect, the tumor being hard and very tender. Cold saturnine applications were then industriously employed and continued for several days; during which time the attempts at reduction were repeated with no better success. The patient having refused, after repeated solicitations, to submit to any operation, remained in nearly the same state until about the 10th of May, being two weeks from the attack, when the tumor subsided, and became soft, insensible, and crepitous; at the same time some appearance of tumor was observed in the most depending part of the scrotum, accompanied with pain. This increased rapidly until the 14th, when the tumor, having attained the size of a man's head, burst, pouring out a quantity of pus, mixed with fetid sanies. The strangulated and sphacelated parts of the omentum having been separated from the sound, after destroying the hernial sac, had fallen down into the scrotum, producing inflammation and suppuration sufficient to effect their discharge. The abscess, in a few days began to heal, and, by simple dressings only, the patient recovered, and is now living, without experiencing any inconvenience from what has happened.

## ARTICLE V.

*Professor MACLEAN against the DOCTRINE of PHLOGISTON; in a Letter to Dr. MITCHILL, dated College of New-Jersey, 16th July, 1798.*

MY DEAR SIR,

I RECEIVED yours enclosing the printed letter, which, at Dr. Priestley's desire, you forwarded to me.

It was my intention to have answered the second part of his Observations on the Doctrine of Phlogiston, &c. before now, but I have been otherwise more agreeably, and, I hope, more usefully employed; however, he will hear from me as soon as I can find leisure.

The experiment with the zinc does not seem to be of more consequence than that with the iron, and admits of an easy explanation on antiphlogistic principles.

The flowers or white oxyd, was formed by the union of the oxygen in the atmospheric air with the zinc. The inflammable air or hydrogen gas, and the black powder, proceeded from the decomposition of the water dissolved in the air, and the oxydation of the zinc: while the oxygene of the water formed with the zinc the blackish oxyd, the hydrogen was evolved in the state of gas.

Blackish oxyd of zinc contains less oxygene than the white oxyd, and its being formed in preference during the decomposition of the water, is a proof that zinc, like many other bodies, combines with different proportions of the same substance, with unequal force. It is so much disposed to unite with the quantity of oxygene necessary for the formation of the blackish oxyd, that it decomposed the water to obtain it; but, under the circumstances in which the experiment was made, it could not separate from the hydrogen, a sufficiency to become the white oxyd.

When the black powder or oxyd was heated in confined air, the addition necessary to form the white oxyd was afforded without the opposition of any force sufficient to prevent its union. And it was from this union taking place, that the black powder became white, and the acid was diminished and rendered less pure.

The black powder yielding no oxygene when heated, is no proof that it contained none; even the white oxyd, which the Doctor allows to contain the pure part of the atmosphere or oxygene, does not afford it when exposed to the same temperature

to which the black powder was submitted; nay, I have never heard of its parting with oxygene at any temperature.

This subject I will consider more particularly again; but, in the mean time, I wish Dr. Priestley would attend to an experiment mentioned in page 301 of the 1st vol. of his Experiments and Observations. There we are told he got flowers or white oxyd of zinc, and inflammable air or hydrogen gas, by passing the steam of water over red hot zinc. I have not repeated this experiment, but if he has been accurate, it will, if taken in connection with the one related in his letter, be destruction to his hypothesis.

The oxygene in the white oxyd must have been furnished by the water, for steam and zinc were the only substances employed. The hydrogen also must have come from the water, for the formation of the flowers or white oxyd, in other circumstances, is not attended with an evolution of hydrogen gas—as for instance, when it is formed in atmospherical air, then, as the Doctor says, “the pure part of it, (oxygene) no doubt, enters the calx (oxyd),” “while the phlogisticated part (azote) remains unaffected.” Thus you see his experiments tend to prove that water is composed of hydrogen and oxygene, and if it be the case, the antiphlogistic doctrine is, I believe, incontestible.

I am, with much esteem,

Yours sincerely,

JOHN MACLEAN.



## ARTICLE VI.

*Dr. PRIESTLEY on RED PRECIPITATE of MERCURY, as favourable to the DOCTRINE of PHLOGISTON; in a Letter to Dr. MITCHELL, dated Northumberland, July 20, 1798.*

DEAR SIR,

**T**HOUGH I have not yet heard of the receipt of my last to you of June 14th, relating to an experiment with zinc, I take the liberty to send you an account of another with red precipitate, which I think favourable to the doctrine of phlogiston.

The most plausible of the arguments against the existence of phlogiston, as a necessary component part of a metal, is drawn from the phenomena of the calcination and revivification of mercury. This metal, exposed to the atmospheric air in a certain degree of heat, is augmented in weight, and becomes a calx, called *precipitate per se*, and in the new nomenclature, *an oxyd of mercury*. The additional weight which it has hereby acquired is from the purest air, which it gives out when it is exposed to a greater degree of heat. As this is done in glass vessels, it has been concluded that, though air was expelled from this calx, nothing entered to supply its place. This calx, it was therefore said, becomes a metal without phlogiston, and that from analogy, other calces may do the same.

The fact is acknowledged, and the conclusion would be readily admitted, did not other facts seem to authorize a different inference. For though this calx of mercury can be revived in close vessels, yet when it is revived in contact with inflammable air, this air is imbibed by it; and there is another calx of mercury, viz. that made by the vitriolic acid, which cannot be revived by mere heat. To reconcile these appearances, I have said that mercury may become a calx without parting with any of its phlogiston. Many other calces are not free from it, though they do not retain enough to give them a metallic form; and mercury, like iron, may contain more or less phlogiston without losing its metallic properties.

This, however, has not been deemed satisfactory; and with respect to the seeming absorption of the inflammable air in which the calx of mercury is revived, it is said that the pure air emitted by the calx uniting with the inflammable air, forms *water*. But, besides that no sufficient quantity of water is found when this process is made over mercury, experiments which I have made since my last publication on the subject, prove that neither water,

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nor any other substance is formed by it; and also, that the quantity of inflammable air actually absorbed is so great, as to render it highly improbable that it can ever be revived without it, or the phlogiston, which is the principal ingredient in its composition.

By means of a burning lens, I heated a quantity of red precipitate in inflammable air, in a glass vessel confined by water, till one hundred and one ounce measures were reduced to ninety-five. Then, examining the residuum, I found that one measure of it mixed with an equal quantity of nitrous air occupied the space of 1.77 measures. Computing from this it will be found that it contained a quantity of pure air equal to 7.22 ounce measures, which added to the 26 which had disappeared, make 33.22 ounce measures of inflammable air which had been decomposed and absorbed by the calx in its revivification. For that the air expelled from the calx had not formed water, was evident from its being mixed with the remainder of the inflammable air, and there was no sensible quantity of fixed air in it; though I find in my register of experiments, that I have sometimes found it in this process; nor can this difference in the result be thought extraordinary, when it is considered that fixed air certainly consists of pure air and inflammable air, and that it is found in other processes similar to this.

In another experiment of this kind, I revived a quantity of the precipitate in thirty ounce measures of inflammable air, till twelve ounce measures disappeared, and the standard of the remainder, examined as in the former case, was 1.75. From this it appeared that 1.495 ounce measures of air had been expelled from the calx, and that 13.495 ounce measures of inflammable air had been imbibed by it.

As a good deal of the calx was sublimed in this process, the best method of ascertaining how much inflammable air is imbibed in the revivification of a given quantity of mercury, is to compare the quantity of pure air that is yielded by a given quantity of the calx, with the quantity of inflammable air that corresponds to it in these experiments. Now an ounce of precipitate yields about sixty ounce measures of pure air; and since in these experiments, 46.71 ounce measures of inflammable air were absorbed when 8.71 ounce measures of pure air were emitted, sixty ounce measures could not be expelled without the absorption of 322 ounce measures of inflammable air; and since mercury gains, as Mr. Chaptal says, about eight per cent. in being converted into precipitate, an ounce of mercury must contain 362 ounce measures of inflammable air, or rather the phlogiston that enters into it. An ounce of lead, I have shewn, requires 108 ounce measures of inflammable air, an ounce of bismuth 185, of tin 377, of copper from verditer 403, and of iron 890. How much is contained in silver or gold I could not ascertain in that method.



That mercury revived either by means of inflammable air, or in close vessels, has the same properties, will not be denied; and if so, it must consist of the same principles, and in the same proportions, or nearly so. I am therefore inclined to think, improbable as it may appear, that the same principle which is essential to the constitution of inflammable air, i. e. phlogiston, passes from the fewel through the glass. There is, however, only the choice of this difficulty, and that of an ounce of mercury containing either 362 ounce measures of inflammable air, (that is the phlogiston in it) or none at all. It is not denied that LIGHT and HEAT, both of which are allowed to be *substances*, though the weight of them cannot be ascertained, pass through glass. They both have certain properties, and are transferable from one substance to another, according to known affinities. And why may not this be the case with *phlogiston* also? Light certainly passes through glass, and is known to give to some substances colour, smell, and taste, which have usually been ascribed to phlogiston. That it does not revive the lead in passing through the hot glass, is no sufficient objection; for the same substances in different combinations, and different states, have different properties. The doctrine of chemical affinities has yet many difficulties attending it; and it requires the nicest discrimination of circumstances to make consistent tables of them. However, I only propose certain facts, which have not been considered before. Let others account for them in the best manner that they can.

I have made many experiments on the revival of precipitate in inflammable air, and never failed to find a great absorption of it, whether I found any fixed air in the remainder or not; and I should have repeated it much oftener, and on a larger scale, in order to ascertain with more exactness the quantity of inflammable air that is decomposed by a given quantity of precipitate, but that it has happened more than once, that the vessels in which I made my experiments have exploded, in consequence of the stand on which the focus of the lens fell becoming red-hot after a sufficient quantity of the pure air was produced, and mixed with the inflammable air. This accident, however, is a proof that the air expelled from the precipitate had not formed either water or fixed air. With care, however, much the greatest part of the inflammable air may be made to disappear without any explosion.

I hope soon to send you an account of other experiments, and shall be glad if you shall think them worthy of a place in your Repository.

With much respect, I am,

Dear Sir,

Yours sincerely,

J. PRIESTLEY.

## ARTICLE VII.

*Objections to the ANTIPHLOGISTIC DOCTRINE of WATER; by Dr. PRIESTLEY, in a Letter to Dr. MITCHILL, dated Northumberland, August 23, 1793.*

DEAR SIR,

**I** THINK myself much obliged to you, and the Editors of the *Medical Repository*, for inserting the articles I have already sent you on the subject of *phlogiston*: and hope you will not object to a few more, calculated, as I hope, to bring a controversy of some importance to a satisfactory conclusion. The following appears to me to shew that the modern doctrine of water consisting of *oxygene* and *hydrogene* is not well founded; since, according to one set of experiments, it consists wholly of *oxygene*, and in the other, wholly of *hydrogene*.

If it be the water that is decomposed in procuring fixed air and inflammable air from charcoal, by means of steam, and if water consist of *oxygene* and *hydrogene* in the proportion of 85 parts of the former to 15 of the latter, they must be found in the same proportion in the result of the experiment. Fixed air is also said to consist of 28 parts of charcoal, and 72 of *oxygene*; and the inflammable air that is procured in this process, is said to consist of *hydrogene* and a little of the charcoal, without any *oxygene*.

But I have shewn, that by a slow supply of water, the whole of any quantity of water is expended without producing any fixed air at all; the whole produce being that kind of inflammable air which is said to contain no *oxygene*. Consequently, according to this experiment, water consists of *hydrogene* only. See my *Observations on Air*, (the new edition) vol. ii. p. 284.

This is not my assertion only. It is confirmed by Mr. Watt, whose accuracy no person will question. He says, in his *Description of a Pneumatical Apparatus*, subjoined to Dr. Beddoes' *Considerations on the Medicinal Use of Factitious Air*, p. 84. "It has been observed by Dr. Priestley, and confirmed by my experience, that when much water passed in the form of steam, there is much fixed air formed; but little or none when the water is admitted so sparingly that no steam reaches the refrigeratory."

When I made the experiment here referred to, I supposed that heavy inflammable air contained fixed air in a combined state, because fixed air is found when it is decomposed with pure air. But I am now satisfied that this fixed air is produced in the process by the union of the two kinds of air. That this *must* be so in

some cases is evident, because the fixed air so procured is heavier than all the inflammable air employed.

The reason why more fixed air is produced when the supply of water is copious, is, I presume, because more water is necessary to the constitution of fixed air than to that of inflammable air.

From this experiment with *charcoal*, it would appear that water consists wholly of hydrogene; but from another that I made with *terra ponderosa aërata*, it will appear to consist wholly of oxygene. For when water, in the form of steam, is made to pass over this substance in a red heat, nothing but the purest fixed air is procured, without any inflammable air at all.

These experiments favour my general hypothesis, that water is the basis of all kinds of air, and that without it no kind of air can be produced. In some cases, as, perhaps, in that of the light inflammable air, it may constitute all that can be ascertained by *gravity*. And notwithstanding the great use that the French chemists make of scales and weights, they do not pretend to weigh either their *calorique* or *light*; and why may not *phlogiston* escape their researches, when they employ the same instruments in that investigation?

I am, dear Sir,

Yours sincerely,

J. PRIESTLEY,



## ARTICLE VIII.

## CONCERNING THE ELK.

*By the late E. H. SMITH, Physician.*

THE accounts hitherto published by naturalists of the Elk and the Moose, two very remarkable animals of the deer kind, are confused and unsatisfactory. Beside the misapprehensions which they contain relative to both animals, all the difficulties in the way of obtaining just notions concerning them have been increased by the writers of Zoology having confounded one species with the other. Another source of error *probably* exists in some real dissimilarity between the Elk or Moose of Europe, and the Elk and Moose of North-America.

The description of the Moose-deer, by Mr. Dudley, (Philosoph. Trans. No. 368. p. 165.) I have every reason to believe is correct, as far as it goes: but it applies strictly to the *Moose*, and not to the Elk, which is a different animal.

M. de Buffon (Histoire Naturelle. L'Elan et le Renne.) appears, in several places, to have mingled the descriptions of both animals; and certainly considered Elk and Moose as two names for the same creature. And this is the more remarkable, as the several quotations which he has made from different authors contain manifest contradictions; as will be evident to any person who has seen either the Moose or the Elk.\* The reader of M. de Buffon, therefore, will not be surprized if he obtain no clear notion of the *Elan*: as it is not probable that the illustrious author himself had a distinct conception of the subject of his description.

In Mr. Smellie's translation of Buffon (vol. vi. p. 350, &c.) there are several additions to the original article. The animal and head of an animal, mentioned by Mr. Allomond, were probably of the Moose kind.

Dr. Goldsmith (Hist. of the Earth and Anim. Nature. Art. Elk) acknowledges the discordancy of the various histories of the Elk; which he also supposes to be the same with the Moose; and he labours, very ineffectually, to reconcile the descriptions of authors. The figure given by him, resembles neither the Elk nor the Moose; and the reader will conclude the Doctor's account with

\* See p. 543. Tome iii. p. ii, edit. 8vo. a Paris. 1775. The description (inserted p. 554 of the same edition,) copied from the Memoirs of the Academy of Sciences, is of the European Elk, and resembles the Moose more than the Elk of America; to which, however, it bears a greater likeness than is observable between this last and the Moose.

as little satisfaction as he appears himself to have done—when he says, “after all, this animal is but indifferently and confusedly “described by authors,” &c.

The confusion and contradictions of preceding writers have been supposed to be avoided or removed by the celebrated Mr. Pennant, in his *Arctic Zoology*, a work to which those who are better able to judge on such subjects than I am, ascribe transcendent merit. In this work (vol. i. p. 19. art. Moose) the author pronounces “the Elk and the Moose (to be) the same species; the “last derived from *Musu*, which, in the *Algonkin* language, signifies that animal.” And this opinion seems to have been quietly acquiesced in; and the substance of Mr. Pennant’s account has been copied into the *Encyclopædia Britannica*, and perhaps into other works of equal credit and circulation.

An opportunity having been presented to me of satisfying myself that Mr. Pennant has erred in describing the Moose and Elk as a single animal, I think it my duty to correct this mistake of that learned and amiable naturalist; and I am too well convinced of his love of truth and ardor for the advancement of natural knowledge, to doubt of his receiving my correction with candour and delight. It may be proper for me to premise that, from the best information that I can obtain (and I have had occasion to converse with several persons who professed to be well acquainted with both the Elk and the Moose), the history which has been given of the Moose, by that gentleman, is essentially just in every other respect than what relates to its identity with the Elk.

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IN August and September, 1797, I visited, repeatedly, in company with Dr. Mitchell, Dr. Milner, Mr. Dunlap, and other gentlemen of my acquaintance, four Elks, then exhibited in this city for gain. Two of them were males, which the keeper assured us were but two years and a few days old; one a female, somewhat more than three years of age; the fourth a male fawn, a year old. They were taken separately, a few days after their birth; and had been reared by men, for the purpose above-mentioned. They were very docile, and might be handled and examined with perfect safety.

**COLOUR.** In this they all exactly resemble each other. In the spring, the colour of the hair is reddish; it then changes to a greyish dun (which was its appearance when observed by us); and, in autumn, to a grey, which continues through the winter. The rump is of a pale yellowish white; the colour extending about six or seven inches from the tail, on all sides, and very distinct from the general colour of the body. A black semicircular line, of unequal width, (from 2 to  $\frac{1}{4}$  inches) separates the white of



the rump, on either side, from the dun or grey of the body. The forepart, or shin, of the legs, and the nose, are black. The under lip is fleshy; and marked, in all four, in an uniform and peculiar manner. Near the cheek, on each side, it is black; and a black stripe divides it, equally, underneath. The rest is white.—The male has a short mane, about two inches longer than the rest of the hair on the body. At this time the hair was very short; but in winter it is said to be four inches in length, and the mane six; and of the colour of the body. The male also has a beard, or covering of hair, under his throat and upon his breast, which, though short in summer, grows out, in the course of the autumn, six or more inches beyond the hair of the body; and is then, as now, of a deep black colour. This beard is wanting in the female. The male sheds it every spring.

HEAD. The head (as will be seen by the figure) resembles that of the common deer, and of the horse, much more than that of the Moose, and is pointed and handsome. The neck is rather long and handsome.

The Elk has an oblique slit or opening under the inner angle of each eye—externally, of near an inch in length; which is said to communicate with the nostril.\* But this we could not correctly ascertain by examination, though there seems no reason to doubt the fact. Something of the same kind obtains in the Fallow Deer, supposed to be analogous to the *puncta lachrymalia* in the human head. (See Mr. White's Nat. Hist. of Selborn. See also Encyclopædia, art. *Cervus*.) A like opening is noticed by Sparman, and supposed by him to answer the purpose of facilitating free respiration, in the Cervine Antelope—(*antelope bubalis* of Pallas.) See Encyclopædia, art. *Capra*.

The use of this opening is differently explained by the proprietor of the animals here described. He assures us that the Elk possesses the power, by strictly closing his nostrils, of forcing the air through these apertures in such a manner as to make a noise which may be heard at a great distance; that he has seen the wild animals do this frequently; and that the design of it is to alarm each other when they suspect any danger near. He has taught those in his possession to make a similar noise; but it was too feeble to cause any observable dilatation of the slit.

If the above explanation of the keeper of these Elks be just, it will probably lead us to a more accurate notion of a circumstance related concerning the *Rupri Capra* or Chamois of the Alps, of whom it is said that “when he smells or hears any thing

\* Mr. Campbell, of Richmond, Virginia, informed me, that in the skeleton head of an Elk, which he had seen, the opening under the eye communicating with the nostril, was so large that the thumb might be easily introduced into it.



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# ELKS.



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“ which he can not see, he *whistles* or *blows* with such force, that the forests and rocks re-echo with the sound.” (See *Encyclopædia*, art. *Capra*.)

**HORNS.** The female has no horns. The appearance of the horns of the fawn exactly resembles those on the head of the principal figure (opposite p. 18.) given by Mr. Pennant.—The males (as the keeper informed us) drop their horns annually, in May, then leaving a pith about four inches in length, which is soon covered and protected by velvet. In eight weeks the horns begin to grow again. In the animals we saw they had been growing about eight weeks. On our first visit, the horns were uniformly covered with a smooth velvet. About ten days after, the velvet was coming off in narrow strips, leaving the horns bare. By the middle of September they were entirely free from it. The keeper informed us that the animals freed their horns from it, when wild, by rubbing them against trees. Now, they derived the same aid from the posts, &c. of their stable; and the proprietor occasionally assisted them. It was observable that a small oozing of bloody lymph sometimes succeeded the removal of a strip of the covering.

The horns of the Elk, instead of being palmated as are those of the Moose, consist of three principal divisions:—1. The brow antlers, which the hunters call the *altari*; 2. The two middle prongs—called the *fighting-horns*; and, 3. The *horns* properly so called. The two first retain their simplicity; the last increases in complexity every year. They do not, as those of the Moose are said to do, acquire a new branch every year; though something analogous actually occurs. When the animal enters his third year, a single prong or point comes out on the inside of the *left* horn; the next year, a similar point on the inside of the *right* horn; and so alternately. Four short points, called *pikes*, were now apparent, one on each brow antler, and one on each fighting-horn: They seldom exceed an inch in length.

The following measurements were made of the horns of one of the male Elks. They were somewhat longer than those of the other; notwithstanding an inch or two had accidentally broken off from the end of one of them.

	F.	Inch.
Distance between the roots or origin of the horns,		4
Brow antlers,	1	6
Fighting-horns, not measured, but about the same.		
Longest horn,	3	
From the tip of one horn to that of the other	2	6

I recollect to have seen, in the Museum of Yale College, New-Haven, Connecticut, some years ago, a remarkable pair of horns; supposed to have belonged to a Moose or Elk. They were not palmated; and, though I had not at that time devoted any attention to

subjects of Natural History, yet from the general idea which I retain of their figure and composition, I am persuaded that they must, at some period, have ornamented the head of an Elk. If I am right in this particular, it will afford us some notion of the size to which the horns of this animal attain. The horns in the Museum of Yale College, if I do not misremember; were said to weigh 55 or 56 pounds.

**SIZE.** As the animals now described had by no means attained their full growth, it is impossible to give any precise information concerning it. The measurements made of them in their present state are as follow:

	F.	Inch.
Length of the <i>male</i> , from the tip of the nose to the tail, along the line of his back, (the males were nearly of a size)	7	3
Of the female, (a year older than the males)	7	9
Height,	4	7
Round the girth or belly,	5	6
the withers,	4	10
Length of the head;	1	11
tail,		3
From the extremity of one ear to that of the other,	2	2
Length of the ear,		9

The brisket of the Elk very much resembles that of the Ox.

**PLACE AND FOOD.** The Elks which were exhibited here were brought from Upper Canada. They are said to be found in almost all the back country of the United States, as low down as Virginia. In respect to food, as these had been domesticated from infancy, nothing particular could be learnt from them concerning what they most affected in the wild state. What appeared remarkable to us was, that they all ate *tobacco*, as variously prepared by the tobacconist, with greediness. This the proprietor assured us was a natural appetite; and that the wild Elks ate the wild plant. We thought that this required further evidence; notwithstanding, we are informed by Hasselquist, that the *Cervi Capra* of Barbary "loves the smoke of tobacco; and, when caught alive, will approach the pipe of the huntsman, though otherwise more timid than any animal." Encyclopædia, art. *Capra*.

**YOUNG.** The rutting-time is from about the 20th of September, to the 1st of October. The female goes about nine months; generally brings forth twins; and it seldom happens but that one is male, and the other female.

**GAIT, &c.** The hoofs of the Elk are very much cloven; and, like the Moose and Rain-deer, he makes a great clattering with them in travelling. He is very fleet. A stranger who was viewing these Elks at the same time with us, told us that he had seen

Elks used in sleighs the last winter; and that they were easily managed, very strong, and very serviceable. He represented them as travelling at the rate of 18 or 20 miles an hour. It is possible that it was the Rain-deer that he saw used in this manner, in Canada.

**FLESH AND SKIN.** The flesh is said to be excellent; and the skin employed for various useful purposes.

**OIL-SPRING.** On the outside of each hind leg, the Elk has a small vesicle or bag, which contains a thin unctuous substance, that the hunters call *oil*, and the bag the *oil-spring*. The male is said to open this, by means of his horn, as the horns begin to grow; when the oil spreads over the young horn, and is supposed to nourish and protect it. This he does regularly, the keeper informed us, at 10 P. M. and at 4 A. M. The female has not been observed to make any use of this oil, except when wounded. She then, it is said, opens the bag with her tooth, and applies the oil, by means of her tongue, to the wound.

In rutting-time, the Elk is represented as contriving to throw his urine upon this vesicle; which inflames in consequence, and emits a strong scent, whereby the animals discover each other in the woods. With regard to the superstitious notion concerning the Elk's curing himself of the epilepsy, by means of his hind hoof, &c. (see Pennant's Arctic Zoology, art. Moose,) may it not be probable that the belief originated from the use he makes of the oil-spring; of which the earliest European writers might be ignorant?





## ARTICLE IX.

*An Account of a Species of CANTHARIS, found in Buck's County, Pennsylvania; including Observations on its Medical Qualities.*

*By ISAAC CHAPMAN, Physician.*

**T**WO or three years ago, William Smith, an intelligent person in my neighbourhood, informed me, that one day, as he was at work, he accidentally mashed an insect on his shoulder, which, in a short time, produced a complete vesication; and it appearing to be the insect here described, I was determined to gather some of them, and give them a trial in my practice; which, however, I neglected doing until last summer.

This insect has a very near resemblance, in outward form, to the Meloe (vesicatorius) alatus viridissimus nitens, antennis nigris, (Linn.) or Spanish Flies, as they are commonly called; but is rather smaller than even those brought from Spain, and of a very different colour: the head is of a very light red, with black antennæ; the elytra, or wing cases, are black, margined with pale yellow, and a stripe of the same colour extends along the middle of each of them; the tarsi have five articulations; the mouth is armed with jaws and furnished with palpi.

I found them in greatest number in potatoe patches; and when the potatoes are young they frequently devour all the green leaves; they are also found among beets and garden purslane, the leaves of both which plants they are very fond of.

In the summer of the year 1797, observing them so plentiful in my garden, that they nearly destroyed those vegetables for which they had a predilection, I determined to gather some of them, and try their medical qualities; and, accordingly, one afternoon I went out, and soon caught as many as, when dried, weighed about an ounce.

When I had dried them, Isaac Praul, one of the young gentlemen studying medicine with me, powdered five or six of them, and laid the powder on a plaster, about an inch and a half square, and applied them to his ankle, and in eight or nine hours they raised a very good blister: he observed they produced a very slight strangury.

Finding them, in this first trial, to answer my expectations in the fullest manner, I determined next to try them in some cases of disease where I thought blistering indicated: and from my notes the following observations are extracted.

1. A. W. aged 21 years, had been for two or three years much disordered with nervous symptoms, which sometimes produced slight paralysis of one arm and leg, for which he had been several times blistered with advantage. And this complaint now appearing in his arm, I, in the evening, applied a plaster of these flies to his wrist, and desired him to come to me in the morning. When he came in the morning, the blister had been cut and dressed with cabbage leaves, and, to my great satisfaction, I found the vesication had been more perfect than any the European flies had produced; and I found the water dropping from the dressing as he came to me. He said it produced no strangury. The plaster was on about ten hours.

2. Not long after the above case, A. W.'s sister, aged 18, informed me she had been much afflicted with pain in her head, for which, among other things, I directed a blister to be drawn on the back of her neck; and the same plaster that had been on A. W.'s wrist was applied without any addition of flies; was on about eleven hours, and drew a very good blister.

3. M. C. aged 20. I applied plasters of these flies to her ankles, where they drew very good blisters; and a few evenings after, the same plasters, without any addition of flies, were applied a little below her knees; but she being very delirious, was so uneasy that the nurse was induced to take them off four hours after putting them on, at which time she saw no appearance of vesication; but in the morning she was much surprised to find large blisters filled with much water.

Those being the first cases in which I used these cantharides, I have noted them more particularly; since which I have used them in near one hundred cases as vesicatories, and in every trial I found their qualities equal, and rather superior, to that of the European cantharides; and they appeared to have full as much effect in relieving the symptoms and removing the diseases for which they were applied, as the European; and their effect on the system was the same, having, in several cases, produced a slight strangury; and the diseases in which I used them were various, as fevers, pleurisy, nervous diseases, &c.

Having determined the quality of this insect as a vesicatory, I wished to know if this quality pervaded the whole fly, or lay in a particular part; observing that internally the insect had a very different appearance from those brought from Europe. In the thorax the muscles have a white appearance, and in the abdomen of the dried insect is a hard white substance, about the bigness of a grain of wheat: this appears to be composed of a glutinous and oily matter, with particles of salt intermixed, and is divided into two parts: one part is very hard, round, and not so white as the other, and is situated in the upper and middle part of the abdomen;

the other forms a leaf that envelopes the round part, fills the lower part of the abdomen, and is very white. These, when powdered, appear like meal; and, when rubbed with water, form an emulsion that looks like milk.

4. After carefully removing the cuticle of three or four flies from the white substance in the abdomen, I powdered it, weighing about half a grain, and spread the powder on a plaster about the size of a pistareen, and applied it to the ankle of one of my students, which, in eight hours, raised a good blister.

5. I took the elytra of four or five flies, broke them to pieces by rubbing them between my thumb and fingers, when they appeared as light as dust, and did not weigh more than a quarter of a grain; this I spread on a plaster, nearly as large as a pistareen, and applied it to my own ankle, which, in nine hours, raised a good blister.

6. Joseph Wilson, one of my students, applied about half a grain of their legs, unpowdered, on a plaster nearly as large as a pistareen, to his ankle, and in eight or nine hours they drew a good blister.

From these experiments it appears that every part of the insect is endowed with an equal, or nearly equal degree of their quality; they likewise shew their great power, as about one quarter of a grain was sufficient to produce a good blister, as large as a pistareen; and I have no doubt, had the same plaster, without any addition of flies, been re-applied, it would have drawn, repeatedly, three or four blisters.

I have not given them internally; but from their similarity of effect to those brought from Europe, when outwardly applied, I think there can be no doubt of their having the same operation when administered inwardly.

This insect must be a very valuable addition to the materia medica of the United States: and if the attention of physicians, and the inhabitants of the country can be sufficiently turned towards them, they will, in a few years, take place of those brought from Europe; and I have no doubt but a sufficient quantity of them can be gathered, at a very moderate expence, to supply the United States, if they are to be found in as great numbers in other parts as in my neighbourhood.

They appeared, last summer, in such numbers, in my garden, (which is a small one) that, with very little trouble or time spent, I could have gathered a pound of them at least.

To point out the method in which they may be gathered, killed and dried, I will relate the practice I pursued.

I took with me into my garden an earthen mug that would contain a quart; in this I put the flies as I caught them in my hand: as they seldom attempt to make use of their wings to fly, nor could

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they creep up the sides of the mug, it contained them with safety. Finding them very tenacious of life, living several days after the heads were completely bruised, I set the vessel containing them in boiling water, which, in a few minutes, deprived them of life.

When killed, I laid them on wrapping paper, and exposed them to the rays of the sun, which, in two or three days, dried them sufficiently. Perhaps, if they were dried in an airy place, in the shade, more of their medical qualities might be retained; for, undoubtedly, part evaporates in drying, as very pungent volatile effluvia arise from them, as appeared on placing an ounce of them in my parlour window to dry: there soon arose from them such acrid, disagreeable effluvia, as occasioned a very pungent, prickling sensation in my nose; and I felt a considerable degree of uneasy sensation in my head, which made it necessary to remove them out of the room.

They might be dried in the open air, provided they be kept from the dews and rain; but they should be kept out of bed-rooms as long as any effluvia arise from them.

These cantharides are certainly worthy the attention of physicians, their medical qualities being equal to that of those brought from Europe; and, as far as I can judge from repeated trials of them, superior. As vesicatories, they are more certain in their operation than any I have procured from the apothecaries' shops; and they may be procured at a cheaper rate; and, being a production of our own country, a regular supply may always be had, notwithstanding foreign wars and an interrupted commerce.

To people residing in the country, the knowledge of this insect and its qualities must be of great advantage, as it will enable them to gather, in their own gardens and fields, one of the most useful and powerful medicines in the materia medica. With a little attention they can not only gather sufficient for their own use, but to supply the cities and towns; and if they shall be found in as great abundance throughout Buck's county as in my neighbourhood, sufficient may be gathered in that county to supply one half the United States.

As no difficulty attends gathering them, children may be profitably employed in that business; and as cantharides bear a high price, frequently from ten to sixteen dollars the pound by retail, they will be an object worthy the attention of many people; and when, by this means, a sufficient quantity of them shall be gathered to supply the place of those imported, many thousands of dollars will be retained in our country, that are annually sent to Europe for this article.

## ARTICLE X.

*On the Disappearance of SWALLOWs in Autumn; in a Letter from Mr. PETER COLE, to Dr. MITCHILL, dated New-York, September 25, 1798.*

DEAR SIR,

IN consequence of the epidemic now raging in this devoted city, I have not had an opportunity to give you a detail of what I intimated to you some time ago, relative to the disappearance of *Swallows*.

In my early years, a number of my school companions and myself used to make it a practice to hunt what we termed *Ground-Swallows*, (*hirundo riparia*) in a bank in the neighbourhood of this city, contiguous to where the Jew's-burial-ground then was. In one of these boyish amusements, I recollect two gentlemen passed nearly by us, who stopped and examined the birds we had dug out of the hill; whereupon a conversation took place relative to the migration of the Swallows. The gentlemen both agreed that they were preparing for their winter quarters, and one of them farther added, that he supposed that numbers of them kept in a meadow close by. These observations made such strong impressions on my mind, that they have never since been erased.

After our revolutionary war was over, and my return again into this city in 1783, in order to be convinced of the truth on this curious and controverted subject, I made it a practice to walk around the Collect,\* mornings and evenings, in the seasons when they assembled, in order to mark their flight or return again; but could not discern any thing material until the 3d instant. As I was standing at my door, between the hours of five and six in the morning, I observed a very large flock of Swallows flying in an easterly direction. I immediately repaired to the pond where there was already a vast number collected in the reeds and rushes. They continued coming for nearly the space of half an hour, and vast numbers of them were flying over the water in almost every direction. Some of these birds appeared to run on the surface of the water with great rapidity towards the east corner of the pond; and in the twinkling of an eye, disappeared under the water and rose no more.

They seemed to crowd principally towards that particular spot.

\* A pond of fresh water adjoining a marsh in the vicinity of the city of New-York.



But what is somewhat remarkable, and deserves particular notice, is, that among the rest I observed a number of *white* ones intermixt with the rest. While I was standing on the edge of the pond with my spy-glass, Mr. Brooks, a particular acquaintance of mine, who lives near the place, came towards me. I mentioned my errand to him. He stood with me a considerable time, and saw the same. I observed to him that there were *white ones* among them. He replied that they were seen three or four days ago. His word may be relied on as a man of strict *honour* and integrity.

Thus, Sir, I have given you a short sketch of what has come within my own knowledge, and what I earnestly wished to discover. I hope I shall not intrude upon your patience if I subjoin an extract from the Christian's, Scholar's, and Farmer's Magazine, volume the second, page 735—it runs thus:

February 23, 1790. In Ulster County, in the state of New-York, on an island in the Never-Sink-Creek, nearly in the latitude of  $41^{\circ} 30'$  North, a Mr. Baker, in the beginning of the month of March last, having cut down a large hollow beech tree, to his surprize, found the cavity in the tree nearly filled with the common Barn-Swallows (*hirundo rustica*) of this country, in quantity (by his estimation) nearly two barrels: they were in a torpid state; but carrying some of those which were not injured by the fall of the tree near a fire, they were presently reanimated by the warmth, and took the wing with their usual agility. This may be depended on as a fact.

I take the liberty also to mention another relation from the American Museum, volume the third, page 451—2. It is taken from Mr. Josiah Blakeley's letter to Mr. Carey, dated Baltimore, January 7, 1788. As the piece is of considerable length, I shall only quote a few passages from it—he begins thus:

The history of our common Swallows has long been a problem in ornithology. Whilst people in general supposed them birds of passage, a few who appear to be better informed, supported the contrary. The opinion of the many was founded on what they thought probable; that of the few on facts. In the year 1780, I was conversing with a person who lived about twenty miles from Boston, on the phenomenon of the sudden exit, but gradual and irregular return of Swallows. The gentleman to whom I made these remarks, replied, that they were not birds of passage, and the cause of their sudden disappearance, but irregular return, was, they had a fixed day for immerging in the water, but none for emerging from it. On my doubting his hypothesis, he told me, that as a neighbour of his, not long before, was draining a pond, on a warm day, near the season of the year in which the Swallows first appear, his attention was attracted by observing the mud, which, in consequence of draining the pond, had for some time

been exposed to the sun, move and appear animated; he then ordered a quantity of this mud to be conveyed into a room in his house, which he caused to be gradually warmed by a slow fire. From this mud there soon arose a number of Swallows, hovering over himself and family, who had been spectators of their *resurrection*.

These few observations, however imperfect, may possibly afford a large field for speculation to the philosophic mind, and lead to useful discoveries. For my own part, I am now become a proselyte to the doctrine of the Swallow's remaining in a torpid state during the winter, not only from speculative researches, but *ocular demonstration*.

PETER COLE.

Pennant, in his *British Zoology*, vol. i. p. 414, feels disposed to smile at the accounts given by **OLAUS MAGNUS**, **DERHAM**, and **KLEIN**, of the submersion of Swallows. Let the physiologist and anatomist reason on the matter as they may, there seems to be positive evidence of the fact. E.



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## ARTICLE XI.

*Observations on the Use of the WARM BATH, in Cases of laborious Parturition; communicated in a Letter from Dr. WILLIAM DEWEES, Lecturer on Midwifery in Philadelphia, to Dr. E. H. SMITH.*

DEAR SIR,

Philadelphia, July 31, 1798.

I PROMISED you the result of my experience, observation and inquiries, respecting the use of the warm bath, in cases of laborious parturition, arising from rigidity of the soft parts.—I have taken some pains to collect facts on this subject, and have endeavoured to weigh its merits with all that impartiality which ought to accompany an inquiry after truth. I think I may venture to say, with safety, that I have not been influenced by prejudice in my investigation, or directed by caprice; but, on the contrary, have, as far as my own practice and the experience of my friends will allow, given fairly the result of its effects.

The warm bath is by no means a new remedy in that species of labour, in which I have thought blood-letting of so much consequence. Few writers on the subject of midwifery have failed mentioning it among other means to overcome the rigidity of the soft parts in laborious labours, that does not depend on a mal-conformation of the pelvis. The French accoucheurs, more particularly, make frequent mention of it; yet none of them, that I am acquainted with, have laid any particular stress upon its virtues in these cases, or place any great dependence on its effects. It has been rather recommended as a probable, than as a certain remedy, and stands upon much the same footing as opium—sometimes, perhaps, succeeding, but much more frequently failing—with me it has ever been of little or no consequence; nor can I obtain a more favourable character of it from the friends I have consulted. The result, then, of my experience, inquiries and observation, may be reduced to three heads: 1st. Its being almost always inconvenient—2dly. Its being sometimes ineligible—and, 3dly. Its always being limited, and uncertain in its effects.

The very great difficulty that generally attends the warm bath, makes a very strong objection to its use; or, in other words, renders it almost impossible to be employed, as very few people are in possession of a suitable apparatus.\* It might, however, on

\* Whenever I mention the warm bath, I would always wish to be understood to mean the universal warm bath, presuming it to be what you, in your letter, adverted to.

extraordinary occasions, with great difficulty, be procured; but, in obtaining it, much time would be lost, particularly in the country, where this kind of labour is by far the most frequent. The lancet we may always have at hand.

It is sometimes ineligible, occasioning, in some instances, very profuse and alarming hæmorrhages. A fatal instance of this kind happened not long since in the practice of a physician in the neighbourhood where I formerly practised. It was universally attributed to the warm bath; and the Doctor himself, in a conversation with me, inclined to the same belief; at the same time assuring me he derived no advantage whatever from the warm bath, as the parts were no more disposed to yield than before; and the woman eventually suffered a lacerated perinæum. The warm bath, in this instance, evidently did mischief, by preventing the tonic contraction\* of the uterus from completely taking place, whereby the vessels of the uterus were not contracted upon, and a fatal hæmorrhage ensued. This is not the only instance in which it has done harm in this way. A Dr. Tom, who had an extensive practice in this line, and who employed the warm bath frequently in these cases, informed me that it never failed producing a more than ordinary flow of blood from the uterus; and, in some instances, this happened to an alarming degree. He, however, urged, in defence of his employing it, that he knew nothing better—opium had always failed with him—and that he considered the warm bath as the dernier resource, adding, he thought it had sometimes done good. Besides, cases occur where we could not leave our patients to themselves sufficiently long to derive any advantage from the bath, was any to be expected, without running a risk of the most dreadful consequences ensuing: for instance, the case I sent you sometime since.† Here it would have been impossible to have left my patient a minute to have been placed in the bath, as it needed not only all my care, but likewise great exertion, to prevent the head of the child escaping through the anus, &c. Again, the inconvenience, nay, I may say, the almost impossibility of rendering the woman proper assistance when in the bath, will readily occur, and will be an additional objection to its use. But, above all, the extreme indelicacy that must appear when employed in that situation, was it ever practicable, would be sufficient to render it the dread of the woman, and the aversion of the modest practitioner.

With me and with my friends it has always been limited and uncertain in its effects—so much so (as I have already observed)

\* By tonic contraction, I mean that power that reduces the uterus to its natural size, after having been distended.

† See Med. Repos. vol. ii. p. 24.

as to be of little or no consequence; its influence having never extended beyond partially relaxing the more external parts, and even this relaxation continuing but a short time after the bath was desisted from. I have never known it have the least effect on the neck or mouth of the uterus; nor can I find that it has ever done so unequivocally in any instance as far as my inquiries have extended. It frequently has produced no effect whatever, not even on the external parts. And should it ever relax the more external parts, no great advantage would be derived as long as the mouth of the uterus continued rigid; and I cannot find that it ever has had that effect. The yielding of the neck of the womb appears to be a distinct process, very often, from the relaxation of the other soft parts; at least they do not always keep pace with each other, having frequently seen the uterus well dilated, with a very rigid os externum, and vice versa—the one attended with an increased secretion and discharge of glairy mucus; whereas the other is not accompanied with these marks. The vagina and external parts, sometimes, after having been well relaxed, become again rigid and unyielding; but the uterus, after having been once well dilated, never (as far as my observations extend) closes, and makes resistance, until after the expulsion of the child: so that it appears that all these parts are not influenced, at all times, by the same laws or causes.

It may perhaps at first sight appear a paradox, that in some cases I should fear the warm bath producing a too great discharge of blood from the uterus, and directly after assert that in no one instance could I find it had any effect on the os uteri. But I do not perceive any contradiction here, as every body must admit, that the developement of the neck of the womb, or its perfect expansion, must be a very different process from its tonic contraction. In the one instance, a peculiar arrangement of the fibres that constitute the neck or mouth takes place, so as to admit of the passage of the child, &c. Whereas, the power which reduces the uterus to its original size after the expulsion of its contents, and by which a too great discharge of blood is prevented, in the other instance, is diminished—hence hæmorrhagy. And we may, in some instances, safely, I think, conclude that the warm bath, although it does not produce relaxation, may yet prevent contraction.

With respect to fear being entertained, that the necessary quantity of blood to be drawn to accomplish the design in view, being more than can be well borne, and occasioning a tedious convalescence, you may rest assured is groundless. I do not rest this opinion upon a solitary instance, but upon many; and I particularly mentioned in the case related to you, that that woman had a rapid convalescence, notwithstanding the great quantity that was drawn. Nor have I seen any thing untoward happening (where



it has been employed to a very great extent), that could possibly be attributed to the loss of blood. Nay, I do not recollect a single instance where any thing particular supervened in all the cases I have been under the necessity of employing it; but, on the contrary, their recoveries were rapid, and without what is commonly called *pull backs*. The case related to you was chosen from several, because of the great quantity of blood that was drawn, and the very remarkable circumstances that rendered it necessary. It was by no means intended to imply that every case required an equal quantity; for, on the contrary, in cases of great rigidity, thirty or forty ounces have been sufficient, and, in some instances, a much less quantity has answered.

Besides what I have urged above, I must not omit telling you that I have experienced, in the most convincing manner, the superior efficacy of blood-letting to the warm bath. A case occurred to me that put the two remedies, I think, to a very fair trial. A woman had been a long time in labour, and from the great rigidity of the parts concerned, the midwife, entertaining no hopes of a speedy delivery, thought proper to send for a physician. He ordered the warm bath, and thirty-five drops of laudanum; these not succeeding as he expected, the woman was again ordered the bath and the anodyne. Several hours were spent in this way; the woman every hour or two was placed in the bath, and took fresh quantities of laudanum—but all without benefit. I was now called in. We agreed that the woman should be very freely bled. This was done. When, upon the loss of about thirty ounces of blood, she grew very sick and faint, her friends grew uneasy, and would not allow the bleeding to be carried to complete fainting. I was obliged to tie up her arm, and rest satisfied with what was already drawn. This, however, fortunately proved sufficient; for the parts began immediately to relax, and in about three quarters of an hour, she was made the happy mother of a living child.—This case decides most unequivocally, I think, the superior efficacy of blood-letting; and the quantity here lost was very trifling, when compared with its advantages. Nothing unfavourable happened afterwards. The woman had a speedy getting up.

I am, Sir,

Yours with respect,

WM. DEWEES.

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 ARTICLE XII.
 

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*Answer to the Question, Whether any, and what, Effect is to be attributed to the greater or lesser quantity of Variolous Matter, introduced into the System by Inoculation, &c.*

By LOUIS VALENTIN, *Officer of Health of the first Class, and lately in Chief of the French Hospitals in Virginia—a Fellow of many Academies.*

I HAVE read, in No. I. of the first volume of the Medical Repository, that communications are requested on the subject of the quantity of matter inserted in the inoculation of the small-pox. The attention of practitioners is called on that point: whether the greater or lesser quantity of variolous matter introduced into the system, will produce a more or less severe fever and eruption. That opinion is countenanced by some Physicians of good character. Without expatiating on a practice now so generally used, in which I have been reared up twenty-three years ago, and which I continued for four years at Norfolk, with great success, I will say only that I have seen the present case often become a question.—Some thought the degree of fever and quantity of eruption are increased—others modified by the quantity of matter introduced by inoculation. Both experience and observation have, according to me, answered it as far as it may be expected.

I never perceived any difference, with respect to the intensity of the fever and the number of pustules, when I made many punctures, and introduced the greatest quantity of fresh matter I could possibly. Whether all the limbs, or several parts of them, be inoculated at the same time, with the thin matter which first appears in the pustules, and has a more certain effect than that which is maturated, or whether only one puncture be performed, it is all one. I never make incisions; the inconvenience and trouble attending them being sufficiently known. I make punctures, and never draw blood.

I do not think that a milder disease is communicated by diluting the variolous matter, which is not too old; for here is my dilemma: either the matter to be inserted has the requisite qualities, or not. If it is liquid, just gathered and immediately inserted—if the subject has all the necessary dispositions for the absorption and unfolding of the disease, only one atom of virus is as powerful as many drops to give it. If the dilution of dry and new matter is not in reasonable proportion, or if it is rendered too liquid

with water, it may have no effect: likewise, when undiluted, it is incapable of being absorbed; when too old, of acting and producing the desired effect. But, in all cases, should the smallest particle that one can imagine be absorbed, it is sufficient to put in motion what we call disposition to that disease, as much as when a more considerable mass of matter is inserted. This may be easily conceived and illustrated by the following comparison, if allowed: Does not every one know, that one grain of powder, inflamed in the pan of a fire-arm, produces the explosion of the whole charge of the gun, as well as when the same fire-pan is filled up with powder? Surely the explosion, in both cases, is neither more nor less considerable; therefore the quantity of inserted matter has no influence to produce the number of pustules. Sometimes the whole surface of the body was covered with pustules, when I made only one puncture, and loaded the point of the lancet with a very small particle of diluted matter, collected for many days, and in the state of maturity; as I have oftentimes seen the contrary by endeavouring to insert the greatest possible quantity of virulent and fresh matter, just taken before the maturation, in performing a number of punctures, and a light fever, and very few pustules, (sometimes a local small-pox) was the result. Likewise, I have washed, with fresh or salt water, the inoculated part, immediately after the operation, and the infection took place. It was the same with young people, who, struggling at the very instant of the insertion, caused the lancet to fall from the inoculator's hand; the instrument passed through the stocking, pricked the leg, and wrought its effect as well as if the insertion had been performed on a naked place. Besides, all these circumstances depend on the good or ill conditions of the individual, and his dispositions to catch the disease.

I shall be happy if these simple reflections may be of any usefulness, and elucidate, to a certain point, that interesting subject.\* There are also some observations of Dr. Giraud, inserted in the Memoirs of the Society of Physic in Paris, on the same matter. He has repeated the experiments often and often, and constantly found the same result.

Montpellier, August 20, 1798.

\* Some hints about it are to be found in my Dissertation, printed at Nantz, in the year 1786, *De optima Methodo Variolæ Inoculandi; et Inoculatos Tractandi*; which may be had in the library of the Philosophical Society of Philadelphia. It is dedicated to Dr. Dezoteux, who, after having gone over twice to England, contributed the most to extend that beneficial practice in France, and whose opinion, concerning the present question, was inculcated to my mind, and became verified by my own practice.

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## R E V I E W.

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ART. I. *Medical Inquiries and Observations: Containing an Account of the Yellow Fever, as it appeared in Philadelphia, in 1797; and Observations upon the Nature and Cure of the Gout and Hydrophobia.* By *Benjamin Rush*, M. D. Professor of Medicine in the University of Pennsylvania. Vol. v. Philadelphia. *Thomas Dobson.* 1798. 8vo. pp. 236.

THE former publications of the author of this work, on the Yellow Fever, have been justly sought after and read with great avidity. The zeal he displays in the pursuit of truth, his indefatigable labours to investigate the nature of this disease, and the enlightened interpretation he offers of many of its mysterious phenomena, have assigned him a distinguished rank among the benefactors of science and humanity. Placed in a situation where the worst ravages of the disease have taken place, he has lost no opportunity of pursuing his inquiries concerning it, and communicating the result to the world. In our opinion, his meritorious career, in circumstances so trying and perilous, cannot be too warmly exhibited to the applause and imitation of the medical world.

In connection with the 4th volume of his *Inquiries and Observations*, reviewed in former numbers of this work, the author begins with an account of the weather and diseases which occurred in part of the year 1795, and the whole of the year 1796. The importance of this statement will be obvious to every reader. The constitution of the atmosphere in this country, for several years past, has been favourable to the generation of pestilential diseases; and while this continues, it will be especially interesting to record all the appearances of weather and diseases that can be supposed to relate to it. Long and minute observations will probably be necessary to detect the nature and causes of such noxious constitutions of the atmosphere, and to explain the grounds of their irregular and desultory operation in the different seasons and situations where they are observed to exist.

The opinion, quoted by our author from Mr. Webster, of a connection between pestilential epidemics and the occurrence of earthquakes, and of the eruptions of volcanos, the appearance of comets, meteors, &c. is supported by history and certainly deserves the closest attention. But strong objections will arise to the supposition, hinted by the author, of a connection between a

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morbid constitution of the atmosphere and the halo or corona, described by a writer in the Philadelphia Gazette of July 25, 1796. This corona seems to have exhibited nothing uncommon; for it is well known that phenomena of that kind are very frequently seen throughout North-America. They have been alleged to proceed from the same causes that produce the rainbow. Water collected into drops, and falling in rain from the clouds, will, under certain circumstances of the sun's rays, display the colours of the rainbow; the same water rarified into vapour or thin cloud, and under a different disposition of the sun-beams, will present the more dilute colours, and all the varied shapes and sizes of the corona. The different texture of the clouds will account for a prodigious variety in the appearance of these phenomena. And as, therefore, the various modes of refraction and reflection of the rays of light in passing through particles of vapour will produce all these phenomena, there seems to be good ground to conclude that no connection exists between such coronas and a morbid constitution of the atmosphere.

Having given a sketch of the weather and diseases from the close of his former work on this subject to the beginning of the epidemic in 1797, Dr. Rush states, that the first appearances of the Yellow Fever were observed in July. In the month of August, the cases became more numerous; and about the middle of that month, the disease began to prevail in the village of Kensington. It was chiefly confined to the district of Southwark, and the village of Kensington, for several weeks. In September and October, many cases occurred in the city, but most of them were easily traced to the above sources. After the first week in September, no diseases were to be seen but Yellow Fever. On the 10th of October the weather became cool, and on the night of the 12th and 13th of the same month, there was a frost, accompanied by ice, which appeared to give a sudden and complete check to the disease.

The fever, in the opinion of our author, was derived partly from the putrid exhalations from the gutters, streets, ponds, and marshy grounds in the neighbourhood of the city, and partly also from the noxious air emitted from the holds of the snow Navigation, from Marseilles, and that of the ship *Huldah*, from *Hamburg*.

No new premonitory symptom was observed except tooth-ach, which remarkably preceded the attack of the fever in several cases.

Dr. Rush next proceeds to deliver an account of the symptoms of the Yellow Fever, as they appeared in the blood-vessels—in the excretions—in the nervous system—in the senses—in the lymphatic system—in the skin—and in the blood. Many interesting observations are here detailed, but as they do not readily admit of



foridgment, and differ not materially from the description of the disease formerly delivered by the same hand, we are compelled to refer to them only in general terms.

The various types or forms of this fever, as noticed by our author, are extremely worthy of attention. It assumed almost every possible grade of mildness and malignity. Attention to the milder grades will not only put physicians on their guard against the insidious progress of the disease, but serves also to evince the connection of this destructive epidemic with others which pass under a less alarming denomination.

The means of preventing an attack of the disease, adopted by the author, are entitled to great consideration. He sheltered himself, as much as possible, from the rays of the sun, and from the action of the evening air, and accommodated his dress to the changes in the temperature of the atmosphere. He reduced his diet, and lived sparingly upon tea, coffee, milk, and the common fruits and garden vegetables of the season, with a small quantity of salted meat and smoked herring. His drinks were milk and water, weak claret and water, and weak porter. The advantages of this regimen entirely accord with our observation. In addition to it, and on the ground of experience, we would recommend a very frequent and plentiful use of mild diluents, sometimes accompanied by a moderate portion of some sound fermented liquor, such as a weak mixture of claret, porter, or cyder and water. With respect to abstinence, it is to be apprehended that mistakes have been committed in some instances, by pushing it too far, and continuing it too long. Where persons are subjected to great exertions and fatigue, during such a malignant epidemic, it cannot, we conceive, be advisable to adopt a regimen calculated to reduce the strength far below its usual degree.

A striking illustration of the good effects of depletion, as a preparative in strangers to encounter the dangers of a baneful climate, is produced by the author, in a communication from Dr. Borland, one of the physicians of the British military hospitals in the West-Indies. "In the beginning of August, 1797, 109 Dutch artillery arrived at Port-au-Prince in the Bangalore transport. The florid appearance of the men, their heavy cumbersome clothing, and the season of the year, seemed all unfavourable omens of the melancholy fate, we presumed, awaited them. It was, however, thought a favourable opportunity by Dr. Jackson and myself, to try what could be done in warding off the fever. It was accordingly suggested to Monsieur Centurier, the chief surgeon of the foreign troops, and the surgeon of the regiment, that the whole detachment should be blooded freely, and that the morning after a dose of physic should be administered to every man. This was implicitly complied with in a day or two

"after; and at this moment in which I write, although a period of four months has elapsed, but two of that detachment have died, one of whom was in a dangerous state when he landed. A success unparalleled during the war in St. Domingo! It is true, several have been attacked with the disease, but in these the symptoms were less violent, and readily subsided by the early use of the lancet."—"The crew of the *Bangalore*, on her arrival at Port-au-Prince, consisted of twenty-eight men. With them no preventive plan was followed: in a very few weeks eight died; and at present, of the original number, but fourteen remain."

It is curious to notice, in connection with the above narrative, a fact quoted by the author from Dr. McKitterick—that the heat of the body in strangers, newly arrived in the West-Indies, has been found to be between three and four degrees above that of the temperature of the natives. How far such depletion as that practised in the case of the Dutch artillery at St. Domingo, might be useful at the beginning of an epidemic season in the United States, may be left to the decision of future experience.

In the next place Dr. Rush proceeds to describe the mode of treatment which he adopted in this disease. And we find it, in general, not very different from that pursued in the epidemics of 1793 and 1794.

The cure was, in most cases, begun by blood-letting, when the author was called on the first day of the disease. When employed later, the advantages of this remedy became more precarious, and, in many instances, it obviously did harm. The information derived from Dr. Jackson of the British army, affords strong testimony on this subject, viz. "that he had cured 19 out of 20, of all the soldiers whom he attended, by copious bleeding, provided it was performed within six hours after the attack of the fever. Beyond that period, it mitigated its force, but seldom cured. The quantity of blood drawn in this early stage of the disease was always from 20 to 30 ounces." But cases do certainly occur in which this remedy is inadmissible at every stage. The attempt to establish general rules for the use of blood-letting in pestilential diseases is extremely difficult, if not impossible. Every epidemic season, and every individual case justly claims the right of deciding for itself. In one season, the disease may generally assume a high inflammatory character; in another, the power of re-action may be chiefly lost, and the system constantly sink and dissolve under the malignity of a decomposing poison. Similar differences may take place in individual cases. In the one instance, blood-letting may be the anchor of hope; in the other, it may precipitate death. And, besides the extreme cases, there are mixed and doubtful ones, where danger threatens on every side, and a choice of difficulties only remains.

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Cathartic remedies were used in this epidemic as formerly. After unlocking the bowels by means of calomel and jalap, our author found no difficulty in keeping them gently open afterwards by more lenient purges. For this purpose, he made frequent use of soluble tartar.

Mercury, exhibited to such extent as to produce pytalism, was greatly relied upon in this epidemic. Dr. Rush lost but two patients in whom this effect was produced.

The diet and drinks directed by the author in this disease are particularly specified. Great danger is asserted to arise from the premature return of the patient to an animal and stimulant diet. Cordial and tonic medicines were ordered in those states when the degree of debility was urgent, and that mode of relief could be permitted. With an account of the favourable and unfavourable signs the author concludes this part of the work.

We have thus presented a brief abstract of the first part of this valuable work. We are sorry to have omitted the notice of many important particulars which it was impossible to comprize within the necessary limits of this article.

After all the labour and learning bestowed on the subject of Yellow Fever, it is to be regretted that medicine is still so feeble in opposing its ravages. This consideration, we hope, will induce many more of our medical countrymen to lay before the public the fruits of their experience and observations in this destructive disease. And we trust our excellent author will not cease to prosecute his researches, till the dominion of medicine over pestilential fevers shall have explored every mysterious question, disclosed every salutary truth, and arrested the terror and desolation which now mark their epidemic appearance.

(To be continued.)

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ART. II. *A Sketch of the Revolutions in Chemistry.* By Thomas P. Smith. Philadelphia. Smith. 1798. pp. 40. 8vo.

THIS oration was delivered before the Chemical Society of Philadelphia, and published pursuant to a resolution of that body. The sketch is concise, as ten pages of the pamphlet are occupied with titles, dedication, vote of thanks, and introductory remarks. It seems there is a rule of the society, directing the orator to exhibit the progress of discovery in the science of chemistry, within the preceding year. Mr. Smith apologizes for departing from this, and, instead thereof, giving his audience an histo-

rical sketch of the revolutions this branch of knowledge has undergone.

We cannot suppress our satisfaction on learning that this elegant and useful science is cultivated with so much care in a neighbouring city, and that an annual oration is provided for the purpose of bringing, at an early day, to the notice of the members, an account of all new experiments. We trust the example which the author of this oration exhibits will rouse emulation, and stimulate inquiry. And we cannot but indulge the hope that this specimen of his taste for chemical science is only a pledge of more extensive and important researches which the public may expect from the same hand.

When the orator affirms that the early days of chemistry were passed in obscurity; nobody will feel a disposition to differ from him. But when he declares the ancient allegories which appear to have a *physical* meaning, "must be passed over as the unmeaning offspring of ignorance and superstition," he has expressed a sentiment to which historians, scholars and antiquarians will rarely give their assent. The inquirer of true learning and chemical taste will find in the allegories of *Apollo* and *Python*, of *Pan* and *Cupid*, of *Prometheus*, and of several others, something well worthy of being dwelt upon and interpreted. Lord Bacon has discussed these things minutely; and it is rather remarkable that our orator had not culled from the *sapientia veterum* of the English philosopher a few flowers to beautify this part of his composition. The countenance given to the idea that the ancient allegories contained discoveries in philosophy and chemistry, by that eminent philosopher and poet Dr. DARWIN, should have taught Mr. Smith, that, in passing over this period of chemical history so neglectfully, he slighted some of the finest subjects for the exercise of his learning and talents.

Every candid reader will condemn, equally with the author, that enthusiastic admiration of antiquity which ascribes to the Priests of Egypt, and their Grecian disciples, a complete knowledge of the physical sciences. He will also be cautious against falling into the other extreme, of saying that they knew nothing about them. While he gives to the moderns their share of applause, he will bestow, with exact impartiality, their just proportion to the sages of earlier times; nor fear that "a smoking chalice," (we do not recollect this) found on the pillar of TRAJAN, (of POMPEY, perhaps, for that is said still to exist in Egypt, while the other was erected at Rome) "should transfer from La-voisier to an Egyptian priest, the honour of the pneumatic theory; or, by the bowl of the sacrifice overflowing with blood, "painted on a mummy, deprive PRIESTLEY" (not to mention

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"HARVEY, MAYOW knew this almost a century before) "of the honour of the discovery of the oxygenation of the blood." Passing over the scattered and unsettled notions of the old Egyptians and Greeks, Mr. Smith refers the date of scientific chemistry to the tenth century of the christian æra, among the Arabians, and describes its transportation to Europe by the crusaders, together with the origin and progress of alchemy in Asia and the west. He is very short on this period, which may be denominated the *hermetic, or alchemical*, extending, as we think, from about the middle of the *seventh* century, when the Alexandrian library is reported to have been destroyed by the Arabs, to the middle of the *seventeenth*, when the learned societies in Europe began to be formed. The history of chemistry, between these two dates, with the experiments on the transmutation of metals, the researches concerning the universal medicine, and the principal inventions during that time, have been sketched out much more particularly and methodically by PETER AFZELIUS ARVIDSSON, in his *Chemie Progressus*, &c. The notions of the scripturalists, theosophists, and rosicrucians, are better arranged by Brucker, in his *Histor. Philosoph. Critica*. And the chronology of authors and books, to say nothing of BOERHAAVE's catalogue, might have been aided and rectified by consulting ERXLEBEN's *Anfangsgrunde der Chemie*, Einleit. § 10—11.

Mr. Smith (in p. 17) makes ROGER BACON the discoverer of the composition of gunpowder. This is ascribing to the friar an invention which he never claimed. On the contrary, by consulting a preface to the edition of his *Opus Majus*, by JEBB, in 1733, Mr. Smith will find reason to believe he got his information from the *Liber Ignium* of MARK the GREEK, a manuscript of which is quoted, as being in the collection of Dr. MEAD. The receipt naming the ingredients for gunpowder, and the rubbing of them in a marble mortar, are particularly mentioned. That Bacon knew it, however, appears further from the description in p. 474 of his work, addressed to Pope Clement the Fourth.

After the reign of alchemy and mysticism was terminated by the revolution wrought by phlogiston, it was natural for us, after reading the title-page, to expect a particular history of that controverted substance and the doctrine concerning it. We find, however, no account of Stahl's application of this principle to explain the phenomena of nature, nor any scientific statement of the objections raised against it. An occurrence of so much moment surely merited a full and ample discussion. For, let the followers of the French Nomenclature exult as loudly as they please, it still becomes them to consider whether their songs of triumph do not precede their victory. In our opinion, the whole of facts afforded by the *inflammation* or *blaze* of bodies, tend to show that these are



owing to the presence of *phlogiston* or the basis of inflammable air, an elementary substance, since mis-called *hydrogene*.

It is to be wished Mr. Smith had treated *Mayow* with more justice. If he had perused that philosopher's writings, we have no hesitation to believe, he would have made more respectful mention of him than his being "famous for a number of *ingenious conjectures*." We do not write from quotations of *HALLER* and *Blumenbach*. We have *Mayow's* five tracts before us. They were printed at the Hague in 1681, and dedicated to Henry Coventry, first secretary of state to Charles the Second. The first is on *salt-petre* and its *nitro-aëreal spirit*, water-spouts, lightning, &c. the second is on *respiration*: the third is on the respiration of the *fœtus in the womb* and in the egg: the fourth is on *muscular motion*: and the fifth is on the *rickets*. Whoever examines his fifth plate, will see that inverted jars of air and animals within them were used in his experiments: and that he knew the use of the double convex lens, to set fire to substances confined in given quantities of air. Such a man, we think, should be called an *experimental philosopher*: and the more so, as some parts of his apparatus appear to be as well contrived as that of the present day. *Mayow* published truths for which the minds of his contemporaries were not prepared. His luminous researches were given to the world about a century too soon. They were lost—and the finding them, and making known their contents, constitute one of the many claims of Dr. Beddoes to public esteem.

After mentioning *BOYLE* and *HALES*, the orator passes to *Priestley*, to whom he ascribes the discovery of oxygenous air, without mentioning a word of the rival pretensions of *SCHEELE*. This brings him to the time when the doctrine of *LAVOISIER* and the antiphlogistians was published, the last in order of the great changes which the science has undergone. He gives a pleasing sketch of the philosophical labours and private life of that promoter of science, and manifests a becoming sympathy and indignation at his untimely and shocking end. It is worth the while to pause and make a remark or two for the purpose of accounting for that excellent philosopher's execution, under the tyranny of *Robespierre*. This man is reported to have been educated from childhood under his uncle the austere bishop of Arras, in all the superstitious and bigotted notions of the Roman church. He was originally destined for the priesthood, but afterwards turned his attention to the law. Devoted to a profession not remarkable for expanding the mind, the prejudices of his early education still clung about the heart of *Robespierre*, and made him a fit instrument for the degraded priests and royalists to work with. The clergymen and nobles who sighed for the restoration of the former condition of things, soon perceived that the most certain

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way of effecting their purpose would be to turn the sword of the revolution against the revolutionists. They accordingly fomented divisions and parties, with all their zeal and influence, for the sake of exterminating as many of the wise and virtuous of their opponents as possible. And by their secret instigation it was, that this ferocious monster acquired so great a degree of power, and for a time committed outrages under the names of liberty and republicanism, which have really rendered those words odious to many of their former friends. Lavoisier was among the victims of fanatical and aristocratical vengeance. Long ago has it been remarked, that cruelty and cowardice inhabit the same bosom. The last hours of Robespierre illustrate this. After he fled from the convention on the accusation of TALLIEN, he was yet strong in the adherence of the Parisian guards; but he had neither courage nor presence of mind to command them. After his flight and capture, he suffered a mean and dastardly death; and with him fell the hopes of his spiritual and temporal supporters. This unspeakable wickedness, fomented and prompted by two of the late privileged orders, is now charged to the account of the friends of the revolution! With Mr. Smith, we deplore the loss of Lavoisier, a man more to be regretted than any other that has fallen since the beginning of the struggle.

Heartily do we join him in the pleasure he feels on the cultivation of this noble science by the fair sex. We hope the example of Mrs. Fulham will be followed, and are willing to look for the time when females shall be considered as deficient in one of their most important accomplishments, unless they are chemists. The subject of *elective attractions*—

And we as heartily concur with him in his spirited concluding observations on the utility of diffusing chemical knowledge throughout America; a business we promote as assiduously as we can, and to which we devote regularly a considerable number of our pages.

ART. III. *An Experimental Dissertation on the Rhus Vernix, Rhus Radicans, and Rhus Glabrum, commonly known, in Pennsylvania, by the Names of Poison-Ash, Poison-Vine, and common Sumach.* By Thomas Horsfield, of Bethlehem, &c. Philadelphia. Cist. 1798. pp. 88. 8vo.

THE botanical and chemical knowledge displayed in this performance, shews the author to have been a student of no ordinary rank. The botanical descriptions indicate a familiar  
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riety with the plants he describes. The chemical experiments bespeak correctness in contrivance and neatness in execution. Es-says like the one before us, not only redound to the reputation of the writer, but to the increase of knowledge. All these plants are natives of New-York, as well as the *R. Toxicodendron*, mentioned afterwards. Mr. Horsfield first gives a minute description of the three species of Sumach; in the course of which he examines whether the *Rhus Vernix*, or Swamp-Sumach, is the Varnish-tree of Japan, described by Kempfer, and declares his full conviction that they are evidently the same.

The next division of the work is on the poisonous quality of several species of *Rhus*, particularly the *Radicans* and *Vernix*; wherein, after some observations on the causes which predispose to their action, he considers the poison as received either from an effluvium of the growing plants, from the smoke of the burning wood, from actual contact of the leaves, stems or branches, or from an immediate application of the juice to the skin. This juice he considers capable of being volatilized by heat, and to be exhaled, during the life and vigour of the plant, in the form of a gaseous fluid, surrounding the plant by an *atmosphere of poison*.

There is one remark of the author on this poison, which we think peculiarly worthy of notice. *He compares its effects to those wrought by nitrous (septon) acid*. There is great reason to believe, that the bases of this acid (septon) enters into the composition of many animal poisons, where it derives activity from the oxygene with which it happens to be connected. The same ingredients probably enter into the constitution of vegetable poisons, of whose acid nature some conjecture may be formed by the beneficial effects experienced from the volatile and fixed alkalies (the active ingredient in the ashes), and from oily substances, in curing the eruption and swelling. This forms a striking analogy between this and other poisons, singularly overcome by alkalies and oils. The eruption is ascribed to the local operation of the poisonous vapour on the skin, and a sympathetic fever is found to agitate the heart and blood-vessels, as in small-pox. Is there not an air too, or variolous gas, which is applied to the whole surface of the body? and does not this infected air inflame the skin, like the exhalation from the poison-vines? The similitude of the cases is worthy the attention of physiologists. If solutions of *soap*, or of *sea-salt*, either in the form of brine or of ocean-water, do good in cases of the sumach-fever, it is probably in consequence of their own decomposition enabling their alkaline bases to neutralize the poison. The remaining remedies, recommended by the author, are blood-letting, purging especially by sea-water, cold, and quick-silver administered until it salivates: a practice very much resembling the modern treatment of several other diseases arising from poisons, particularly yellow fever and small-pox.

The experiments which follow (p. 50—60) on the *Rhus Glabrum*, or common Sumach, go toward the establishment of the following facts: That the saline concretion on the berries is a tartrate of pot-ash; that the gallic acid exists plentifully both in the capsules and leaves, but in a state more fit for economical purposes, in the latter; that it may be advantageously applied to the *dying of black* and the *manufacture of ink*, to the discontinuance of imported galls; and that, for the purposes of *tanning*, its leaves may be substituted for oak-bark. The discovery of these valuable qualities, in dying and tanning, we hope, will be duly attended to by the people of the United States. The leaves and stalks of the common Sumach are already much used in New-York, in preparing sheep and goat skins for morocco-leather.

The author refers to Professor Woodhouse's experiments on persimmon juice. These established, if we recollect right, that the astringent matter of that vegetable substance was composed of *gallic acid and the earth of alum*. Mr. Horsfield endeavours to prove the same in the astringent matter of the sumachs. The remaining experiments in this section refer to the tartarous, acetous and oxalic acids, afforded by the *Rhus Glabrum*, with speculations on their convertibility into each other.

After some experiments and remarks on the black, yellow, and fawn-colours, produced by the species of *Rhus*, Mr. Horsfield attempts an analysis of the Vernix and Radicans, and concludes with some observations on the medical properties of the latter, as an incitant and diuretic remedy of moderate powers, when infused in water, and taken *internally*: and recommends the *external* application of both, in certain stages of mania, melancholia, pulmonary consumption, epilepsy, palsy, and other chronic diseases, which, for a long time, have resisted the effects of powerful remedies.

We shall conclude our review with observing, that it is a very desirable thing to multiply copies of dissertations like the present. A number of the graduates in the American universities have published essays highly worthy of preservation. And it might, probably, answer very well for some editor or bookseller to make a collection of them, after the manner of the *Amœnitates Academicæ* of Upsal, or the *Thesaurus Medicus* of Edinburgh. The Swedish plan is more enlarged and preferable. Mr. Horsfield's performance would make a valuable article in such a publication.

ART. IV. *An Inaugural Dissertation on Cynanche Trachealis, commonly called Croup or Hives.* By John Archer, jun. Philadelphia, Way and Greff. 8vo. pp. 46. 1798.

IN our first volume, No. I. p. 120, under the article of news, it was announced that Dr. Archer, of Maryland, had discovered seneka snake-root to be an excellent remedy for the croup. This was confirmed by his letter, published in our present volume, No. I. p. 27. The author of the present dissertation is the son of that respectable physician; and the mode of treatment he recommends appears to have been, in a good measure, derived from his father's practice. The discovery of a remedy for so violent a disease, certainly merits communication to the medical world, as extensively and speedily as possible. We shall, therefore, give it our assistance; and, as we have no practical experience of the efficacy of the remedy recommended, we shall give the account of it nearly in the author's own words.

He divides the disease into the *symptomatic* and the *idiopathic*. In the former, the effusion into the trachea, &c. are consequences of previous general diseased action in the constitution; in the latter, which is of no less frequent occurrence, the affection of the windpipe, &c. are primary and local, and the phenomena of fever are mere symptoms.

To moderate and remove the fever in SYMPTOMATIC croup, Mr. Archer recommends *blood-letting, purges*, particularly of *calomel*, and *diaphoretics*, especially *tartarized antimony*. He considers *blisters* of little or no service. For removing the preternatural membrane from the trachea and its ramifications, he advises as follows:

"From what little opportunity I have had of observing myself, and from the extensive experience of others, I take particular pleasure in recommending a medicine, which has the surprising powers of dislodging the foreign membrane that lines the interior parietes of the trachea. When I recommend this medicine, I am warranted in recommending it with confidence; for its good effects support my recommendations, and I do conceive that if administered with that regularity and attention necessary in the exhibition of all medicines, it will so often succeed, that others will not be backward in extolling it as highly as I have myself. The medicine I allude to is the seneka snake-root of our country.\* It was first used by my father, about seven or eight years ago, in a well marked case of croup, far advanced, and with success, after the common remedies had been sedulously administered without the smallest degree of relief: since

\* Polygala Senega of Linnæus.



“ that time it has been repeatedly used by him, others, and myself,  
 “ with a similar result. I am induced to believe it will scarcely  
 “ ever fail, when given in the forming state of the membrane;  
 “ and I am confident it will succeed in a majority of cases after a  
 “ complete formation of the membrane. The decoction of the  
 “ root is the manner in which I have generally seen it used; the  
 “ strength must be determined by the physician; it must be so  
 “ strong as to act sensibly on his own fauces, in exciting cough-  
 “ ing, &c. for in this disease the larynx in a great measure loses  
 “ its natural sensibility.\* Half an ounce of the root of seneka,  
 “ bruised, and simmered in a close vessel, in half a pint of water,  
 “ until reduced to four ounces, will probably in most cases be  
 “ sufficiently strong. A tea-spoonful of this to be given every  
 “ half hour, or hour, as the urgency of the symptoms may de-  
 “ mand; and during these intervals, a few drops occasionally, to  
 “ keep up a sensible action of the medicine in the fauces, until it  
 “ act as an emetic or cathartic; then repeated in small quantities,  
 “ and so frequently as to keep up a constant stimulus in the mouth  
 “ and throat. By these means, in the course of two, four, six or  
 “ eight hours, a membrane is oftentimes discharged by the mouth,  
 “ one, two, and three inches in length; sometimes it is swallowed  
 “ and voided by stool. Patients who use the medicine should not  
 “ be permitted to drink any thing whatever for some minutes  
 “ after each dose. The reason must be obvious to all. The  
 “ powder has lately been used,† in doses of four or five grains,  
 “ mixed in a little water, with effects equally pleasing as the de-  
 “ coction, and more so, unless the latter have been carefully pre-  
 “ pared.

“ To account for the action of the seneka, is a subject necessary  
 “ to be inquired into. When taken into the mouth, and swal-  
 “ lowed, its pungency is immediately found to be highly diffusive;  
 “ it quickly excites an almost continual coughing, with repeated  
 “ efforts to swallow, and promotes a plentiful secretion of saliva.  
 “ In my opinion, its operation in curing croup is chiefly local.  
 “ Does this consist in a discharge being excited between the mem-  
 “ brane and the trachea, which, from being less adhesive, the  
 “ whole is readily removed by expectoration, in consequence of  
 “ the coughing, which is simultaneously induced; or by vomiting,  
 “ when the seneka acts as an emetic?—*Dies doceat.*

“ Some will no doubt say, it acts in curing this disease merely  
 “ from its emetic and diaphoretic properties. It would be suf-  
 “ ficient for me to ask those gentlemen, why other emetics and  
 “ diaphoretics will not effect the same purpose. I have, in some

\* Dr. Geo. Monro's Thes. Inaug. Edinb. 1786.

† By the author's father and brother.

" instances, seen it effect a cure, without either acting as an emetic, diaphoretic, or cathartic. Does it not then cure cynanche trachealis chiefly by acting as a *local stimulant*?

" Should the disease be far advanced, and danger appear pressing, calomel, as co-operating with the seneka, may be used advantageously; it should be given freely internally, and mercurial frictions applied externally to the throat and adjacent parts.

" If the limits of this dissertation permitted, I could relate many unequivocal cases of the disease, in which the use of the seneka was followed by the happiest effects. I shall, therefore, only detain the reader with a recital of one to two.

#### CASE I.

" In the autumn of 1796, I visited Miss F—— L——, about three years of age, of a full, gross habit. She had been seized; two days previous to my visit, with the usual phenomena of symptomatic croup. Her breathing was now wheezing, and very laborious; inspiration croupy; cough dry and sonorous; pulse quick and frequent; but discovered scarcely any inflammation; anxiety and restlessness were extreme. I immediately ordered the decoction of seneka, as directed in a former page; and the use of calomel to open her bowels. The seneka quickly excited coughing, with repeated attempts to swallow, and retchings to vomit. In the course of an hour or two, a quantity of viscid phlegm was expectorated, and in a few hours pieces of crusted membrane were discharged, a much more easy respiration took place, and, in sixteen or eighteen hours, I had the pleasure of seeing her as well as usual.

#### CASE II.

" In the spring of 1796, I saw the son of Mr. J—— E——, aged three years. He had had the hives about six months before, and was perfectly relieved by the use of seneka and calomel. The stridulous respiration was distinctly marked, and the parents alarmed, applied as soon as they observed this, as they said, *certain token of danger*. I did not find it necessary to do more than open the bowels, and make use of the seneka; which perfectly restored him in 24 hours."

In order to remove the mucus, or dislodge the membrane from the aspera arteria and bronchia, in cases of IDIOPATHIC croup, he expresses himself in these terms:

" I am of opinion nothing more will be necessary than to administer the decoction of seneka, as directed in a former part of this essay. It will generally be sufficient, I am confident,

“ without any other medicine. The use of mercury may, however, as in the symptomatic kind, be sometimes necessary; for, in advanced stages of the disease, all our efforts combined are sometimes ineffectual in affording relief.

## CASE.

“ In the winter of 1795, I saw the servant child of Mr. S——  
 “ L——. She had been for two days observed to have a wheezing, difficult respiration, peculiar dry hoarse cough; but as no symptom of fever preceded or attended, as her appetite was not impaired, and as she appeared nearly as lively and cheerful as usual, no alarm was excited. These symptoms, however, advanced to such a pitch of violence on the third day, that death appeared to be pointed out, as the inevitable termination of the disease. The peculiar inspiration which attends this complaint, and which most authors view as a pathognomonic symptom, was very striking in the present case. I immediately exhibited an emetic; but without any relief. I then purged her with calomel, and gave the seneka in the usual manner. In eight or ten hours there was considerable relief to the laborious breathing, and scarcely any expectoration was observed; in eighteen or twenty hours, pieces of white membrane were voided by stool; and, in thirty hours, I was pleased to leave her as well as usual.

“ I shall here take the liberty of reciting an extract from a letter I a few days since received from my brother, Dr. Thomas Archer.

“ I have in (I may say) numberless instances effected a cure of croup, by seneka alone; and I have lost many children who were treated in the common way.

“ P—— T——, Esquire's daughter, about four years old, was seized with the usual symptoms of croup: in 36 hours after seizure I was sent for, and found her labouring under the most violent symptoms of that disease, a dry, sonorous cough, without expectoration. The muscles of the thorax and abdomen were thrown into violent convulsive actions, by the efforts of difficult respiration. Pulse natural, and appeared hurried, chiefly from the difficulty of breathing. An ounce of the root of seneka, bruised, was simmered from a pint to half a pint of water; of this a tea-spoonful was given every fifteen or twenty minutes. In less than an hour, a discharge of viscid phlegm took place, in large quantities; respiration became more natural, and, in a few hours, the stridulous breathing was entirely removed. Before I left her, which was in 24 hours after seeing her, she was up, and playing with her playmates.

"I would not," he adds, "give an ounce of seneka as a chance in the cure of croup, for all the *emetic tartar*, *mercury*, and *cant* *tharides* in the United States."

We hope this plain and easy mode of managing such an afflicting disorder by a remedy of our own country, may prove as efficacious when adopted by other practisers, as it has been when employed by the author, his father and brother.

ART. V. *An Inaugural Dissertation on the salutary Effects of Mercury in Malignant Fevers.* By James Stuart. Philadelphia. Bradford. 1798. 8vo. pp. 37.

MODERN practice has greatly extended the use and reputation of mercury. In no instance is this more remarkably exemplified than in the introduction of it in the treatment of malignant fevers. Instead of being dreaded as the means of hastening the fatal tendency of the diseases called putrid, or of producing effects of too harsh and uncontrollable force, it is supposed, by many of the most respectable physicians, to possess powers of appropriate excellence in such cases. Besides the experience of our own country, the testimony of its efficacy derived from the practice of the physicians of the West and East-Indies is so ample, concurrent and positive, as loudly in our judgment to demand attention.

The author of the dissertation before us is deeply impressed with the active and salutary powers of mercury in malignant fevers; and, as the subject is confessedly of the greatest importance, we willingly accompany him through the process of reasoning and illustration by which he endeavours to establish his principles.

In the first place, he offers a definition of the term malignancy as applied to fevers, which he supposes to consist in a great excess of the inflammatory diathesis, or of the violence of stimulus. This is inferred, from the same remote and exciting causes which produce inflammatory fevers, producing malignant fever, when applied in higher degree—from the facility with which inflammatory and malignant fevers are changed into each other—from all fevers, under certain circumstances, assuming symptoms of the highest malignity—and, lastly, from the effects of blood-letting in this state of fever. He therefore defines malignant fever to be *that febrile state, in which there is great over-action in the blood-vessels, or a defect of action, and a disposition to paralysis or gangrene from great excess of stimulus.*

In the next place, the author treats of the *modus operandi* of mercury, when applied to the system. He considers it as an evacuant of fœces, bile, mucus and lymph. The usefulness and importance of its operation in these several respects are treated of with much discernment. He displayed singular intrepidity in examining and tasting the matter of black vomit in several instances; which he found to possess various properties and sensible qualities, and to be derived from different sources; and which also he found not necessarily to be a fatal symptom, but to presage the probable issue of the disease, when the appearances and sources of it are known. Our author likewise supposes mercury to act further by inducing a counter-stimulus in every part of the vascular system, and by saving vital parts by means of a determination to the throat and mouth.

In addition to the modes of action assigned by our author to this remedy, it may not be improper to observe, that, in many cases of malignant fever, it probably operates in a powerful manner by increasing absorption. The dissection of bodies dead of such fevers, commonly confirms the opinion formed by the symptoms of the disease; that congestion, engorgement, and effusion had taken place in vital parts of the system. The vigorous manner in which mercury excites absorption, may be inferred from its efficacy in the different species of physconia, dropsy, &c. After blood-letting to a proper extent, this power is strikingly exhibited in the treatment of hepatitis and hydrocephalus internus, as well as cases of pestilential fever. Some illustration of this action may be drawn from the effects of mercury, when applied to external ulcers; as in this case, a sanious and ill-conditioned discharge is often speedily converted, and probably through the medium of absorption, into a laudable pus. And it is not improbable that the fact, quoted by the author from Dr. Rush, of the swellings of lymphatic glands never suppurating when a mercurial salivation had taken place, may be more simply and naturally accounted for on this principle, than on the vague supposition of mercury possessing the property of counteracting or superseding the operation of the poison thrown on those glands.

In the third place, the author delivers an account of the different modes of applying mercury, and the several means of assisting its operation. He mentions, in detail, with appropriate directions, the modes of introduction by the mouth, by the gums, by frictions, by shoes or socks impregnated with the ointment, by ointment in the form of clysters, and by fumigation.

In the last place, the author delivers an account of the proper treatment of the mouth during a salivation, and the remedies for moderating and relieving it, and obviates the objections to the use of his remedy from supposed injury to the teeth and constitution.



These directions are in the main proper and judicious, but differ not materially from generally received practice.

On the whole, we are pleased to observe the indications of diligent inquiry, careful observation, and good sense, which abound in this dissertation. And we flatter ourselves that the hopes of the public, excited by this performance, will be sustained and exceeded by the usefulness and eminence of the author's future career.



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METEOROLOGICAL OBSERVATIONS for July, 1798,  
made in the Cupola of the Exchange, in the City of New-York.

Days of the Mon.	Thermom. observed at		Prevail. winds.		Clear.	Cloudy	Barometer observed at	
	Sun-rise.	2 P. M.	5 M.	2 E.			Sun-rise.	2 P. M.
1	70	90	S W	S W	2		29 59	29 52
2	76	94	S W	S W	2		29 57	29 57
3	80	94	S W	S W	2		29 58	29 46
4	72	85	N W	N W	2		29 49	29 49
5	68	78	E	S E	2		29 49	29 44
6	64	78	N	N W	2		29 48	29 60
7	64	76	E	S E	2		29 76	29 79
8	70	76	S	S	2		29 63	29 40
9	63	75	W	S W	2		29 50	29 59
10	65	79	S W	S W	2		29 66	29 68
11	71	65	S	N		2	29 59	29 58
12	64	77	W	S W	2		29 57	29 58
13	64	69	N	S W	2		29 57	29 58
14	60	72	N	S	2		29 60	29 60
15	58	74	E	S	2		29 60	29 60
16	68	72	S E	S E		2	29 60	29 59
17	67	78	W	S	1	1	29 58	29 63
18	69	66	W	W		2	29 59	29 59
19	56	68	N W	N W	2		29 61	29 59
20	57	76	N W	S W	2		29 70	29 75
21	64	80	N W	S	2		29 90	29 90
22	66	83	S W	S W	2		29 85	29 75
23	67	83	S W	S W	2		29 70	29 68
24	70	83	S W	S	2		29 60	29 71
25	72	81	N W	var.	1	1	29 72	29 73
26	70	80	E	S E	1	1	29 73	29 70
27	70	90	S	S	1	1	29 65	29 63
28	77	91	S	S	2		29 60	29 60
29	79	90	S W	S W	1	1	29 60	29 60
30	74	81			1	1	29 64	29 60
31	66	82	W	W	2		29 60	29 65

Results of Meteorological Observations for July, 1798.

Mean temperature of the Thermometer at sun-rise, deg. 69 6 hund.  
Do. do. of the do. at 2 P. M. 79 5  
Do. do. of the do. for the whole month, 74 5  
Greatest monthly range between the 3d and 19th, 38 0  
Do. do. in 24 hours, on the 1st, 20 0  
Seven days it rained, and a great quantity has fallen.  
Six days it thundered and lightened in considerable quantity.  
One day it hailed, and a very small quantity has fallen.  
Coldest day the 19th. Warmest day the 3d.

## METEOROLOGICAL OBSERVATIONS for August, 1798.

Days of the Mon.	Thermom. observed at		Prevail. winds.		Clear.	Cloudy	Barometer observed at	
	Sun-rise.	2 P. M.	5 M.	2 E.			Sun-rise.	2 P. M.
1	70	80	S W	S W	2		29 70	29 73
2	68	80	E	S	1		29 80	29 83
3	72	80	W	S E	1	1	29 93	29 91
4	74	81	S E	S		2	29 67	29 59
5	76	84	S W	S W	2		29 67	29 59
6	74	84	W	N W	2		29 59	29 63
7	70	84	S W	S W	2		29 74	29 77
8	72	91	W	S W	2		29 75	29 69
9	76	96	S W	S W	2		29 60	29 52
10	78	90	S W	S	2		29 47	29 40
11	78	89	S	S E	1	1	29 40	29 47
12	74	86	var.	N W	1	1	29 63	29 71
13	74	83	N E	S	1	1	29 80	29 84
14	74	78	E	S		2	29 82	29 80
15	74	82	var.	S W	1	1	29 80	29 84
16	75	85	S W	S W	1	1	29 81	29 80
17	75	90	S W	S	1	1	29 77	29 70
18	76	90	S		1	1	29 66	29 66
19	72	84	N E	S W	2		29 70	29 80
20	74	83	E	S E	1	1	29 80	29 79
21	77	87	S W	S	1	1	29 72	29 67
22	76	84	N W	N E	1	1	29 63	29 71
23	65	76	N E	E	2		29 92	29 92
24	66	80	S W	S W	2		29 82	29 71
25	76	91	S W	S W	2		29 63	29 63
26	79	93	S W	S W	2		29 62	29 59
27	77	85	W	W	2		29 75	29 70
28	69	76	W	S W		2	29 61	29 60
29	67	76	W	N W	2		29 61	29 55
30	67	80	S	S W	2		29 62	29 58
31	68	81	var.	W	2		29 61	29 65

## Results of Meteorological Observations for August, 1798.

Mean temperature of the Thermometer at sun-rise, deg. 78 0 hund.  
 Do. do. of the do. at 2 P. M. 83 0  
 Do. do. of the do. for the whole month, 78 0  
 Greatest monthly range between the 9th and 23d, 31 0  
 Do. do. in 24 hours, on the 9th, 20 0  
 Nine days it rained, and a great quantity has fallen.  
 Fifteen days it thundered and lightened, and in great abundance.  
 Coldest day the 23d. Warmest day the 9th.

METEOROLOGICAL OBSERVATIONS for September, 1798.

Days of the Mon.	Thermom. observed at		Prevail. winds.		Clear.	Cloudy	Barometer observed at	
	Sun-rise.	2 P. M.	6 M.	2 E.			Sun-rise.	2 P. M.
1	68	80	E	SE	2		29 76	29 80
2	67	77	E	E	2		29 87	29 87
3	61	71	E	SE	1	1	29 80	29 75
4	63	74	E	SE		2	29 62	29 58
5	69	74	SW	SW	2		29 39	29 39
6	66	71	E	E	1	1	29 43	29 43
7	64	75	E	SE	1	1	29 58	29 60
8	63	70	SW	SW	1	1	29 60	29 60
9	60	70	E	E	2		29 66	29 66
10	63	77	N	E	2		29 67	29 67
11	66	77	W	N	2		29 76	29 76
12	63	71	E	SE	2		29 97	30 0
13	61	73	E	S	2		29 90	29 83
14	63	76	S	S		2	29 77	29 73
15	68	79	SW	S	1	1	29 75	29 75
16	70	80	SW	SW	2		29 75	29 72
17	69	82	SW	var.	2		29 72	29 74
18	70	76	E	SE		2	29 78	29 78
19	73	79	S	S	1	1	29 78	29 78
20	70	79	E	SE	1	1	29 78	29 78
21	74	76	S	SW	2		29 60	29 67
22	59	72	NW	NW	2		29 68	29 68
23	62	74		S	2		29 63	29 62
24	62	74	N	NW	1	1	29 62	29 62
25	55	64	N	NW	2		29 51	29 45
26	50	64	NW	NW	2		29 70	29 68
27	61	71	SW	SE	1	1	29 60	29 47
28	50	59	W	NW	1	1	29 61	29 56
29	40	52	NW	NW	2		29 75	29 77
30	42	64	W	SW	2		29 82	29 77

Results of Meteorological Observations for September, 1798.

Mean temperature of the Thermometer at sun-rise, deg. 60 c hund.  
 Do. do. of the do. at 2 P. M. 70 0  
 Do. do. of the do. for the whole month, 60 0  
 Greatest monthly range between the 17th and 27th, 11 0  
 Do. do. in 24 hours, on the 1st and 22d, 12 0  
 Eight days it rained, and a small quantity has fallen.  
 Six days it thundered and lightened.  
 Coldest day the 27th. Warmest day the 17th.

*A RETURN of Patients admitted to the Care of the New-York City Dispensary, from the 1st of July to the 1st of October, 1798.*

## JULY.

DISEASES.	No.	Cured.	Reliev.	Died.	Removed, &c.	Result.
Worms	3	3				Admitted 35
Wounds	2	2				—
Amenorrhœa	1	1				Cured 33
Remitting Fever	2	2				Died 1
Intermitting Fever	1	1				Hospital 1
Rheumatism	3	3				—35
Indigestion	1	1				
Head-ach	1	1				
Pneumony	3	3				
Canker Mouth	1	1				
Ophthalmia	2	2				
Incipient Phthisis	2	2				
Diarrhœa	5	4		1		
Sore Legs	1	1				
Hiccough	1	1				
Mumps	2	2				
Dysentery	1	1				
Cholera	3	2			1 Hosp.	

## AUGUST.

Rheumatism	3	3				
Cholera	4	4				
Dysentery	8	7		1		
Phrenzy	1				1 Al. H.	
Gonorrhœa	1	1				
Sore Legs	2	2				
Ophthalmia	1	1				
Dyspepsia	2	2				
Small-pox	1			1		
Bilious Fever	24	20		2	2 Bellev.	
Canker Mouth	1	1				
Atrophy	1	1				
Worms	4	4				
Lumbago	1	1				
Jaundice	1				1 Hosp.	
Contusion	1	1				
Parturition	3	3				
Diarrhœa	10	10				
Intermitting Fever	2	2				



# DISPENSARY.

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AUGUST continued.

DISEASES.	No.	Cured.	Reliev.	Died.	Removed, &c.	Result.
Herpes	10	10				Admitted 96
Syphilis	2	2				—
Abscessus	2	2				Cured 84
Fistula in Ano	1	1				Died 6
Pneumony	1	1				Relieved 1
Apoplexy	1			1		Bellevue 2
Dropsy	2	1			1 Hosp.	Hospital 2
Paronychia	1	1				Alms-H. 1
Dyspnœa	1			1		—96
Film	1		1			
Wounds	1	1				
Gastrodynia	2	2				

## SEPTEMBER.

Bilious Fever	193	167	12	11 Belle.	Admitted 228
				3 Hosp.	—
Dyspepsia	7	7			Cured 200
Cholera	2	2			Reliev. 1
Hæmaturia	1	1			Died 13
Diarrhœa	2	2			Bellev. 11
Herpes	3	3			Hospit. 3
Worms	4	4			—228
Abscess	3	3			
Syphilis	4	4			
Rheumatism	1	1			
Dysentery	2	2			
Lumbago	1	1			
Hæmatemesis	1		1		
Paralysis	1		1		
Bilious Colic	1	1			
Dropsy	1	1			
Scald Head	1	1			

## SUMMARY.

Whole number of Patients admitted into the New-York City Dispensary, from the 1st of July to the 1st of October, 1798,

359

Of this number have been <i>cured</i> , . . . . .	317
<i>relieved</i> , . . . . .	2
<i>have died</i> , . . . . .	20
Removed to the Hospital, . . . . .	6
Alms-House, . . . . .	1
to Bellevue, . . . . .	13

359

HUGH M'LEAN.



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## MEDICAL & PHILOSOPHICAL NEWS.

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### DOMESTIC.

#### *Pestilence.*

**I**N recording the history of diseases since our last number, we perform a melancholy task. The Yellow Fever, whose ravages within a few years past had been so often deplored, has lately renewed its visitation in the United States to a greater extent, and with multiplied horrors. The northern, southern and western parts of the Union have chiefly escaped this calamity. The commercial towns, situated to the eastward of the bay of Chesapeak, and the river Susquehanna, have principally suffered. Portsmouth in New-Hampshire, Boston, New-London in Connecticut, New-York, Philadelphia, and Wilmington in the State of Delaware, besides some other places in inferior degree, have largely shared in this epidemic. Portsmouth and Petersburg in Virginia, are the only places west and south of the Chesapeak and Susquehanna, so far as we yet know; which have been attacked with violence. In all these towns, the sickness and mortality have been great; and, in addition to these, the consternation and flight of the inhabitants, and the derangement and suspension of business, have greatly enhanced the public distress.

Although June and July, with the exception of a few days, had been moderate, cool, and rainy, the weather entirely changed in August, and exhibited a degree of heat, in point of duration and steadiness, if not of severity, very uncommon in this climate. Throughout a great part of September, the heat continued with little abatement; much of October was unseasonably warm; and frost did not take place till a later period of the season than usual.

This epidemic generally appeared early in August; through the remainder of which month, September, and chief part of October, it continued to rage with much violence: in the latter end of October, and in some instances earlier, a sensible abatement had taken place, and in the first weeks of November, the disorder entirely ceased.

From Portsmouth in New-Hampshire, little authentic or particular information has yet come to hand. Report states that the number of deaths did not exceed one hundred, and that the prevalence of Dysentery at the same time with the Yellow Fever, served greatly to swell the amount of mortality.

In Boston, we are told, the disease was nearly extinguished by the 20th of October. The number of deaths is said to have been about 140. The terror and flight of the inhabitants, and the interruption of business took place in this town to a considerable extent.

New-London exhibited a scene of great mortality for several weeks. The alarm and desertion of the town were very great. The amount of deaths we have not been able to ascertain.

In New-York this pestilential disease began early in August, and did not terminate till near the middle of November. A large proportion of the inhabitants, some say two thirds, quitted the town. Great numbers, who remained, deserted the more unhealthy parts of the town, and took refuge in the districts of higher ground and purer air. The wharves and warehouses on the east river were generally abandoned; the shipping was transferred to the north river, and a great portion of business was transacted on that side of the town. Notwithstanding all these circumstances of retreat from infected situations, more than 2000 persons are supposed to have fallen victims to the disease.

Philadelphia stood foremost in the distress and mortality produced by this pestilence. Forty thousand of its inhabitants are said to have left the city, and a large proportion of them at a very early period of the epidemic—a number greatly beyond that which had taken refuge in the country on former occasions. Still, however, the number of deaths amounted to 3446. From Philadelphia the disease was spread along the shore of the Delaware, and raged, as we are informed, with great violence at Chester and Marcus Hook.

Wilmington, in the State of Delaware, though considered a place, ordinarily, of remarkable health, became, on this occasion, one of the seats of this destructive epidemic. In this comparatively small town, although greatly deserted, upwards of 250 persons perished of this disease; a much greater number, according to its rate of population, than died at any other place in the United States during the late season.—The fever also prevailed at the towns of Newcastle and Duck Creek, in the State of Delaware.

Time enough has not yet elapsed to receive from places at a distance any minute accounts of this epidemic. We hope to be able, in some future numbers, to offer details on this subject of a more satisfactory kind. Great zeal is beginning to manifest itself in Philadelphia and in this city, to inquire into the origin and causes of this epidemic, and the best means of obtaining security against its return. The progress and result of these important exertions will be particularly stated in our future numbers.

With respect to the phenomena of this epidemic, we are only, at present, enabled to state what fell under our observation in this city.

In a succinct and rapid sketch, which is all that can be attempted on the present occasion, it will not be expected that we should deliver a minute description of the disease. The ordinary appearances of Yellow Fever are familiar to every medical reader. The peculiar character of this epidemic, as distinguished from the same disease appearing in a different season, and such extraordinary phenomena as may tend to develop and illustrate its nature, will especially deserve notice.

Every grade of disease, from the mildest febrile affection to the most malignant and pestilential, was exhibited in the course of this epidemic. Except in a few situations, the number of mild cases greatly predominated over the malignant. Some assumed the character of intermittents, and yielded to a very slight treatment. Many more appeared under the form of remittents, without any symptoms of malignity, and speedily gave way to the remedies appropriated to such cases.

The more virulent cases of this epidemic seem to be reducible to the following heads. 1. The instances of sudden fatal termination, where the pestilential poison appears to extinguish the vital principle by a direct attack upon its source, or by arresting its distribution through the system. Under this head may be comprehended the cases of sudden death, the attacks of the disease in the form of apoplexy and syncope, great and sudden prostration of strength, giddiness, staggering, stupor, coma, &c. 2. The instances of more protracted illness, with little force of reaction, where the pestilential poison seems more gradually to undermine the vital energy, and, by fastening itself on the stomach and other portions of the alimentary canal, to inflame, corrode, decompound, and dissolve these viscera, and, at the same time, to diffuse its virulent operation over the whole system. In this division will be included the cases which display universal but moderate languor and debility in the early stage, followed by discolouration of the skin, scorbutic blotches, hæmorrhagies, low delirium, convulsions, &c. and which seem to terminate in organic decomposition, indicated by the burning heat and pain of the stomach, the black vomiting, and finally by the appearances on dissection. 3. The instances marked by powerful reaction, where the pestilential poison is supposed to induce the inflammatory diathesis, leading to violent determination to the brain or other vital viscera, and at length to derangement of organic texture. Under this head will naturally fall the cases of violent febrile commotion, attended with great heat, pain of the head, flushing of the face, redness of the eyes, fierce delirium, &c. and exhibiting, after death, to the anatomist, the appearances of congestion, engorgement, and effusion.

It will not be supposed that these distinct forms often exist in a simple state. Such simplicity is chiefly the result of mental abstraction. In the epidemic we describe, those forms were in-



finitely combined, intermixed, and confounded, and frequently left no ground of distinction, but in the predominance of one or the other.

It is well known, that in different epidemic seasons, one or more of the above stated forms of the disease have chiefly prevailed, and given it a peculiar character. Hence we hear of the epidemic being more or less malignant in some seasons than in others; and of remedies failing at one time which had possessed great efficacy at another.

In the epidemic which we now describe, the first of the above-mentioned forms of the disease, so far as we know, did not very often occur. The second and third, sometimes more simple, but oftener variously combined, formed the great mass of the more virulent cases.

To give additional proof of the pestilential nature of this distemper, it may be sufficient to mention, that cases of *bubo* and *anthrax* were observed during its prevalence in New-York this year; and in one person, a patient in the State Hospital, the prevailing symptoms, for twenty-four hours preceding death, were spasms of the pharynx, neck, back and arms, exhibiting the combined horrors of tetanus and hydrophobia.

To give the reader some idea of the condition of the atmosphere, it is highly worth the while to state some of its operations upon other things than living bodies. Foggy weather, with easterly winds, had prevailed between the middle and 21st of September. The pestilential matter seemed to be rendered more active by conjunction with water. The mortality among the people increased. At the same time, it was observed that the iron-railings in the front of houses was covered with a thick and unusual coat of rust; and the smooth and bright parts of the pump-handles in the streets were, during a few hours of rest in the night, exceedingly corroded by every drop of moisture which fell upon them. The leaves of trees on which this eroding moisture had settled, often became spotted; and between this time and the appearance of frost, these spots turned to mortification. At this time, white cotton garments spread to dry after washing, acquired such stains and spots by being suffered to hang out during the nights when this mist prevailed, as to be indelible afterwards by twice boiling in alkaline ley. This rusting of iron and spotting of cotton took place, even in the College-yard, one of the most elevated, airy, and healthful situations in the city. After the disappearance of the fog, a saline efflorescence, supposed to be nitrous, was observed on the pavement of many places, particularly Front, Water, and Pearl streets. So virulent and abundant was the venom, that some inspectors of pot-ash, and some soap-boilers, though usually exempted in former plagues, now sickened, and several of them died.

*Mineralogy.*

The Committee of the AMERICAN MINERALOGICAL SOCIETY have lately published an advertisement, the object of which was to collect into one view all the information that is scattered through the union, relative to the means our country possesses of furnishing objects immediately requisite for national defence. They now take the liberty of offering some remarks to their fellow-citizens, upon the more general objects of their institution, and the means of improving the science it is intended to cultivate.

If the bowels of the earth had furnished no riches but gold and silver, it were better, perhaps, that the hands of men had never penetrated them. But when we remember that iron, the parent of arts and of civilization; that mercury, so useful in experimental philosophy, medicine and the arts; and that sea-coal, the loadstone, and so many other objects without which society could not exist in its present state, are the fruits of mineral labours, we shall be convinced that the world is almost as much indebted to the interior of the earth for improvements, as to its surface for subsistence. Mineral substances enter directly or indirectly into almost every manufacture, whether of objects ornamental or useful. Glass, porcelain, gunpowder, certain of the most powerful acids, some of the most elegant and permanent of our colours and dyes, and the most powerful class of remedies known to the medical art, are chiefly of this class. How various are the forms, and how multiplied are the uses, of the instruments that art has made from the perfect and imperfect metals! Some of these, by their strength and durability, are formed to apply or to resist the utmost efforts of mechanic power. Some that are equally durable yield pliantly to the hand of art, and assume, with readiness, whatever forms convenience dictates. There are those that are ductile almost beyond our conception, and that receive a polish, which is proof against the ravages of time—Some yield readily to the heat of the furnace, while others defy the attacks of artificial fire. The metals, by their different degrees of strength, elasticity, durability, weight and incorruptibility, and other mineral substances, by the still greater number and importance of their qualities, are fitted for uses as various as the imaginations of men, and as important as their wants.

A nation which is deficient either in mineral riches, or in a knowledge of them, is wanting in the most essential requisites of political and commercial independence. The United States have been little explored; but they have given indications of possessing objects to reward the researches of the mineralogist in greater abundance than most other countries. They contain vast chains of ori-

ginal mountains—vast tracts of country, of a secondary and of an alluvial formation—extensive plains, once the beds of lakes, and mountains broken to their centre by the convulsions of nature—it can hardly happen in the course of things, that such a country should not be abundant in mineral resources.

The discovery and improvement of these resources generally, is the object towards which the society wishes to direct its labours. It is hoped and believed that every description of citizens will be inclined, as occasion shall offer, to aid the undertaking. The owners of land will gladly assist in making discoveries which may enhance the value of their estates; the actual cultivator of his farm will find an interest in the discovery of marles, clays, chalk-beds, and whatever else may be useful for manure; the man of leisure, if such there be in America, will find an elegant amusement in the collection of a cabinet, and the man of science an interesting employment in the study of it.

Encouraged by these reflections, the society beg leave to mention to their fellow-citizens, some ideas relative to the means of improving the knowledge of mineralogy in this country, with little expence or labour. They suggest the following ideas, and, at the same time, are ready to consider, with due attention, any different ideas that may be suggested by others:

1st. Societies might be formed in different parts of the United States, and most conveniently in towns which have the means of a ready and cheap communication with the country. These societies might solicit the public in general, and the personal acquaintances of the members in particular, to furnish them with specimens of the products of all mines, ore and coal-beds, and of marbles, marles, clays, limestones, fossils, shells and wood, petrefactions, crystals, and, in general, of all minerals and fossils that appear worthy of attention.

It frequently happens in this country, that farmers discover in ploughing, and by other means, many objects well worthy of being examined and preserved, but which are forgotten and lost for want of proper persons to examine them, and of a cabinet to place them in.

2dly. It would greatly tend to illustrate the mineralogy of our country, and geology in general, if, with every sample received, there should be taken as exact an account as may be of the circumstances of the place where it was found, and of any facts explanatory of its natural history. A paper containing a short summary of such information might always be annexed to, and accompany the specimen.

3dly. The societies formed might keep up a regular correspondence, and might send each to all the others, parts of the specimens they receive, together with the written accounts of them, when-

ever those specimens are of a kind, and in sufficient quantity to be divided. It would also be useful to analyze parts of the specimens received, and to communicate the result. We conceive also, that it would not be necessary to confine our cabinets too strictly to objects merely *mineral*: whatever tends to illustrate the history of the earth and of its component parts, might, perhaps, be admitted with advantage.

A correspondence of this kind, if actively pursued a few years, would furnish our country with several valuable cabinets of mineralogy at little or no expence. These would be repositories where persons inclined to investigate such subjects, either for amusement or profit, might resort for information. They would enable the inhabitants of any one part of the union to take a view of the mineralogy of the whole United States.

The Chemical Society of Philadelphia have laudably set the example, by soliciting information upon the resources of our country, for furnishing an article of great national importance. We also solicit the correspondence of societies and of individuals, upon all subjects mentioned in this address, and in our former advertisement. In particular, the society requests of farmers, miners, travellers, and collectors of private cabinets, any specimens of minerals and fossils which it may be in their power to furnish, together with any intelligence respecting them; and the society will not fail, on its part, to furnish any information in its power, derived from essay, analysis, or otherwise, and to communicate it, with freedom and with pleasure, to societies and to individuals.

By order of the Society,

SAMUEL LATHAM MITCHILL, *President*.

E. H. SMITH, *Secretary*.

New-York, August 8, 1798.

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*Cure of Chancre from Venereal Contagion by Alkalies.*

While experiments are making upon an extensive scale, and with various success, on the cure of syphilis by nitric acid, it is deemed peculiarly proper to inform the advocates of that remedy, that venereal ulceration has also been removed with surprizing quickness, by the local application of the common vegetable fixed alkali, or the carbonate of pot-ash. The following experiment may serve to confirm the doubts of such gentlemen who disbelieve the wonders said to be wrought by the nitric acid; and, at the same time, to give new matter of reflection to those who have ascribed to it something like a specific mode of action. A gentleman, a few days after impure coition, felt an itching on the preputium penis, which soon became ulcerated. As soon as the chancre was discovered, it was cauterized with the septe of silver (lunar caus-

tic), and dressed with ointment strongly impregnated with the sép-tite of quick-silver (red precipitate of mercury).

Notwithstanding repeated dressings, and the strictest observance of cleanliness in all respects, the ulcer continued to spread, and had invaded a considerable space on the prepuce. Finding it yield in no degree to these local applications, recourse was had to mercurial friction; which was performed by rubbing the blue ointment in considerable quantities upon the legs and thighs. Before a salivation came on, the appearance of the ulcer mended, and by degrees it healed. A few days after, the same gentleman having repeated his impure caresses, was troubled with a new chancre, caused apparently from fresh poison breaking out near the frænum. Immediately on its discovery, while yet exceedingly small, and not larger than to contain a pin's-head, it was touched with lunar caustic, and dressed with precipitate ointment, as the former had been, and, in a constitution now charged with mercury, it was expected a cure would be very easy and expeditious. This, however, was not the case. The chancre continued to enlarge, to inflame, and to become more and more troublesome; insomuch, that it was apprehended there would be a necessity for repeating the mercurial friction. But before recourse was had again to this tedious and troublesome remedy, it occurred to me, from the analogy of volatile alkali in curing bites of venomous serpents, and of the fixed alkali and lime in overcoming those acid products of putrefaction which poison the atmosphere, and induce endemic distempers, that it was worth the while to try the effects of an alkaline application to subdue the virus of syphilis: accordingly, the ulcerated surface was covered with some deliquescent salt of tartar. On being first applied, it excited severe smarting; which, however, lasted but a short time. It was dressed with lint, and, on examining it some hours afterwards, it looked better, and appeared to spread no more: after a second application of pot-ash, the appearance of the ulcer was apparently changed for the better; on a third application it dried up, healed entirely, and has been well ever since. Whether in this case the pot-ash operated upon the solids, and introduced in them a new action incompatible with the morbid action, or whether it produced its effects by neutralizing the contagious matter on the surface of the sore, are questions which the physiologist may consider and explain at his leisure. This experiment shews, at least, that there is nothing specific in the action either of mercury, or of nitric acid, on venereal ulcers. Abundance of instances of chancre, cured by alkali, have since occurred in the New-York Hospital.

S. L. M.

November 10, 1798.



A Committee of the Medical Society of New-York, consisting of Messrs. Tillary, Rodgers and Mitchill, were chosen at a meeting of that body, lately held, for investigating the origin, cause and prevention of the pestilential distempers which so terribly afflict New-York, and the other cities and towns in the United States. We hope the report of the Committee will be made up before the publication of our next number. As the Committee have been promised the aid of the municipality, and of the health-office, their means of gaining information would appear to be greatly facilitated, and an opportunity afforded of laying before their fellow-citizens a valuable state of facts.

*A new variety of Iron-ore of the Argillaceous kind, and resembling Basaltes.*

The specimen of columnar iron-ore in my collection is from Germany, and corresponds very well with Mr. Kirwan's second variety of his first family of argillaceous iron-ores. (2 Elements of Mineralogy. Dublin. 1796.) I knew of no other iron-ore of that character until a few months ago. As I was walking on my farm upon Long-Island, surveying the various mineral productions that lay thick under my feet, I observed a small spot that appeared to be paved with stones of a regular figure. On taking up some of them, and examining them, they were evidently of the same constitution with the common argillaceous iron-stone, which lay scattered about in rude lumps. They were, however, of a singular shape. They were about four inches long, and stood erect, side by side of each other, in a stiff loam. Each of them had five sides and five angles; and though not exact pentagons, were readily distinguishable in most of the specimens, from one end to the other. This shape was most perfect at the two ends, which were considerably larger than the middle part, and about one inch and a half across; so that when a specimen of this ore was grasped in the hand, it had some resemblance of a double-headed pestle. In some, however, four sides only were to be traced.

The number of these figured bodies was about thirty-six, though not all of them equally perfect. And they evidently had been formed from a solid circular mass of argillaceous iron-ore of about two feet and five inches in breadth, and four inches in thickness at the central parts, and becoming thinner towards the edges. In the natural fracture of the stone, the fragments took upon themselves these regular forms, very much resembling basaltes; and, like basaltes, though *figured*, they evidently are not *crystallized*, for they are as perfectly terrigenous and opaque as any argillaceous ore of iron whatsoever.

I brought away some of the pentagonal pieces, and could easily

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get more of them; for in taking out the few that I brought away, I disturbed the rest as little as possible.

These specimens go very far towards deciding the dispute, if any doubts still remain, about the *igneous* or *aqueous* origin of basaltes. They support, by the most powerful evidence, the *Neptunian* origin of that kind of figured bodies, and are directly opposed to the *Plutonic* system. The specimens before me prove that argillaceous iron-ore, which nobody has supposed to be a volcanic production, can take on a basaltic figure. With BERGMAN, WEIDEMAN and KIRWAN, I am inclined to believe the weight of testimony is opposed to the formation of basaltic columns by FUSION, and that the true manner in which many, if not all of them, have been produced, is in the MOIST WAY. This new proof, added to Mr. Kirwan's very able paper on *traps* and *basaltes*, I think, settles the controversy in his favour. S. L. M.

We are happy to announce, that Mr. Webster's History of Pestilential Diseases will be put to press in the course of next month.

The design of this publication will be to lay together the principal facts which regard the origin, progress and declension of pestilential epidemics—and the remarkable phenomena of the natural world, such as unusual seasons, contagious diseases among animals, appearance of insects, and other events which may possibly have some connection with the causes of pestilence; with a view to arrive, if possible, to some knowledge of the sources from which proceed the wide-wasting diseases which afflict mankind. A great number of curious facts are collected, and it is believed they will throw much light on this subject, so interesting to the commerce of our cities, and the lives and happiness of men.

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## FOREIGN.

HAVING in former numbers of this work given all the authentic information which had reached us, concerning the use of nitrous acid in syphilis, we hold ourselves responsible for the communication of every thing interesting on this subject.

Mr. William Blair, surgeon of the Lock Hospital, has published the first part of the work he some time ago projected, under the following title: *ESSAYS on the VENEREAL DISEASE and its CONCOMITANT AFFECTIONS, illustrated by a variety of Cases. Essay I. Part I. On the Antivenereal Effects of Nitrous Acid, oxygenated Muriate of Pot-ash, and several analogous Remedies, which have been lately proposed as Substitutes for Mercury.*

Some weeks before the publication of this work, Mr. Blair addressed the following letter to the Editor of the Monthly Magazine:—

“ Having been disappointed of seeing the collection of medical facts, which a correspondent of yours has long since promised to publish, I have committed the result of my own observations and experience to press. This essay will probably appear in the beginning of next month; and, I hope, will exhibit an impartial view of the *whole evidence, as it now stands, both for and against the new plan of treatment*; including a variety of cases which have been recently communicated to me, by different practitioners in London.—As I have no favourite theory to support, it will be my first wish and aim to arrive at the truth, whithersoever it may lead me. At some future period, I shall endeavour to supply what may appear to be deficient, and correct what shall be pointed out as erroneous.”

In the Monthly Magazine for August of the present year, we find the following notice concerning Dr. Beddoes's long expected work:—

“ Dr. Beddoes's collection on ‘*Syphilis*,’ which is so anxiously expected, has been delayed for West-India and other interesting intelligence. A considerable part of it is however printed off, and the work will now make its appearance in a few weeks.”

As connected with this subject, we notice the following case:

“ Mr. Warner, apothecary, in Fore-street, (London) on Feb. 22, 1797, after an attendance of a few days on a patient who died of a malignant fever, was suddenly seized with a vertiginous affection of the head, accompanied with sickness at the stomach, and followed by violent vomiting. These symptoms were succeeded by a fever; during the continuance of which, considerable pain was felt in the region of the abdomen, particularly about the left hypochondrium; and, in a few days after the abatement of the fever, symptoms of jaundice appeared. The tunica conjunctiva of the eye, and the whole surface of the body became of a very deep yellow colour; the stools were of a clay-like appearance, and the urine was very much impregnated with bile, depositing at times a considerable sediment. There was a sense of pain and stricture about the præcordia, accompanied with a considerable degree of tension of the abdomen: and the pain in the left hypochondrium frequently returned. The breathing was sometimes very much affected: the heat of the skin was increased and seconded by a desquamation of the cuticle, and such a degree of itching as proved very troublesome. The state of the pulse was not much affected at any stage of the disease. These symptoms continued

for several months, attended with great languor and debility, an indisposition to motion, together with considerable anxiety of mind.

"As in the course of the disease a variety of symptoms occurred, so different medicines were employed, according to the different circumstances of the case. The bowels were kept open by aloes, rhubarb, and soap. Different bitters were employed: gentian and columbo were frequently used. Myrrh and steel were taken with a view to their tonic effect, and for the mitigation of pain, opium was repeatedly administered.

"Calomel was frequently used, but the state of the bowels sometimes rendering the use of it improper, mercurial frictions were substituted in its room.

"After the use of various medicines, without any important advantage being produced, the *nitrous acid* was taken in the quantity of a dram every day. During the use of this medicine, the various symptoms gradually abated; the yellow colour of the eye and of the skin grew fainter; the tension of the abdomen diminished; the pain and stricture about the præcordia abated; the strength gradually returned, and the appetite was much improved. No inconvenience arose to the stomach or bowels from the use of the acid, till after it had been taken for some weeks, when the patient felt a pain in his stomach; for the relief of which he took a few grains of kali preparatum, and repeated the dose twice or thrice in the course of the week. Whilst it was judged proper to mention this circumstance, it is equally necessary to observe, that the small quantity of the kali taken can hardly affect the conclusion which may be drawn respecting the advantage of the nitrous acid in this instance.

"This report will probably bring to the recollection of the medical reader, the experiments of Mr. William Scott, of Bombay, and the conclusion which he draws concerning the effect of the nitrous acid on the resinous base of the bile, and the resemblance of the effects of this medicine to those which generally occur in the use of mercurials."

"VAUQUELIN has made an analysis of the emerald of Peru, in which he recognizes the new metallic substance discovered by himself, in the red lead of Siberia. It is to this metal that the emerald owes its green colour. Vauquelin designs to repeat his analysis, to determine, with greater precision, the exact proportion of the several component parts."

"Professor Lampadius has made several very interesting experiments to ascertain the combustibility of the diamond. This stone being laid upon red-hot coal, and exposed to the effects of

vital air, was totally decomposed without leaving the smallest particle. As soon as the diamond had attained to a thorough glow, during which it was observed to swell, it began as obviously to decrease in size. All this time vapours exhaled from it, till, after the expiration of five minutes, it totally disappeared. That this was not the effect of mere evaporation, but that actual combustion took place is demonstrated by the circumstance, that as soon as the diamond was brought to a thorough white glow, it continued to burn of its own accord, and became paler when the coal discovered a visible flame, and was not cooled by the torrent of vital air."

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"A very valuable treatise on *metallic irritability*, involving a discovery which promises to prove highly beneficial to the interests of humanity, has been lately published in German, by C. C. Creve, Professor of Medicine at Mayence. M. Creve maintains, from a number of experiments made on the corpses of persons just deceased, as well as on animal bodies, that the symptoms of putrefaction do not constitute an infallible evidence of the actual death of the individual; and that the application of the principle of *metallic irritability* will, in *all* cases, establish the fact of life or death beyond the possibility of mistake. By this means, the danger of *prémature inhumation* may be effectually obviated. The work is accompanied with appropriate and illustrative plates."

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"Mr. Fabroni has discovered, that a juice expressed from the leaves of the socotorine aloe yields, by simple exposure to the air, a very deep and lively violet-purple dye, which is not acted upon by acids, alkalies, or oxygen gas. He thinks it may be highly useful in forming a pigment for miniature painting; and also, dissolved in water, for dying silk, which it will effect without the use of a mordant. Though this aloe is a native of a tropical climate, it is supposed that it might be readily cultivated in the south of Italy."

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"The new metal *titanium*, discovered by Professor Klaproth, has been since examined by several able chemists. Professor Lampadius, of Freiberg, has effected the analysis of the titanite of lime, by means of borax and common glass; it was, however, only reduced into metallic leaves of a darkish copper colour. It appears to have a strong affinity with oxygen, being immediately converted into a white oxyd, and afterwards into a globule of blue glass, on heated charcoal, by means of vital air. A more complete reduction of this metallic substance has been effected by Professor Klaproth and Mr. Hecht, jun. directors to the laboratory of the mining department at Paris; both of whom obtained a regulus of a gold colour."



" *French Aërostation.*

" Citizen Garner has ascended in his balloon for the ninth time, in the last two of which he has been accompanied by a young lady of the name of Celestina Henry. They made the park of Mousseaux (the villa of the late duke of Orleans) the place of departure. The account this aëronaut gives of the incidents which occurred in his several voyages to the upper regions, contains a great deal of novel and interesting information. His highest point of ascension he judges to have been three thousand toises, or six thousand yards, equal to almost three miles and a half. Of this fact, however, he could not be very exact, as the preceding day he had the misfortune to break his barometer on descending at Eganville. But he judges by the quantity of ballast he threw out, by the dilatation of the balloon, by the whistling noise of the gas as he let it escape through the tube, but, above all, by the extreme cold he felt, and especially by the great numbness of his fingers. In passing through the different currents of air, or rather from one current to another, the machine was sometimes whirled round, and once the balloon revolved upon its own axis. In his second voyage with the lady he landed her on the *Plaine de Dugny*, and ascended again by himself, with a view to find a current of wind fair for the metropolis, above that which blew near the earth in a contrary direction. It was in this attempt that he crossed the river Seine three times, and passed through three beds of clouds without finding the current which was to carry him back to Paris. He presumes he attained the excessive height before mentioned, and believes it to be the maximum of elevation consistent with the preservation of the adventurer. In the direction of north-east, he says his eyes first beheld the rising of the sun, for it was between four and five o'clock in the morning, on the 24th of July. This sight he represents as most brilliant and majestic. Though the sun's rays tempered the vast coldness of the air in his ascent, yet, when at the highest, he describes it as absolutely insupportable. This is the moment, he remarks, that the aëronaut should preserve his *sang froid*, and call up all his courage, not so much for the purpose of braving the aspect of the immense abyss below, as to surmount the indispositions he may experience, and which he calls indefinable; among other distressing sensations, a tingling in the ears, a vomiting, an accelerated impetus of the blood, with an inflation of the arteries from such increased circulation. He finished this expedition at six o'clock the same morning, on the plains of Sempigny, on the borders of the river Oise, at twenty leagues from the place where he set out, which run he had made in an hour and three quarters. He concludes his own account of the voyage, and the probable utility of the further cultivation of the science of aërostation, by signifying that a dispatch

might be carried to Holland in eight hours, in a balloon, with advice from the Directory for the sailing of the Dutch fleet out of the Texel."

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"Mr. Socoloff, of Petersburg, has repeated Dr. Franklin's experiments on recovering flies drowned in spirituous liquors. He found, that when these insects had been apparently dead for a quarter of an hour in spirit of wine, they were speedily recovered by covering them with warm ashes. Beetles and spiders were restored to life in like manner."

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"A species of fluor-spar has been discovered in Nertschinck, externally very similar to the common violet coloured fluor, but differing from all others in this particular; that, when heated to a considerable degree, it assumes a beautiful emerald hue, which it loses when cold, and recovers on being again heated. It has undergone some experiments by Prince Gallitzin and M. Von Veltheim, director of the mines, and a satisfactory analysis may soon be expected from the known accuracy and abilities of Professor Klaproth."

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"The celebrated Professor Spallanzani, having observed that certain species of bats appeared to be able to direct their flight in a room perfectly dark as well as in the light, has made several truly barbarous experiments on this subject. He began by pasting up the eyelids of these animals, after which, when let loose, they flew about the room in the same manner as if their eyes were open. Not content with this experiment, he had recourse to the cruel expedient of destroying their eyes entirely; and even after this operation they flew perfectly well from one apartment to another, avoiding every obstacle; and when fatigued, suspended themselves against the walls in their usual manner. These facts the learned professor has thought proper to explain, by supposing that they possess a new sense, unknown, apparently, to other animals, but which enables these to direct their motions when deprived of eye-sight.

"Mr. Jurine, of Geneva, has repeated many of these experiments with considerable accuracy. He extended several twigs of willow across a room, and let loose two bats, which, in their flight, passed and repassed between these twigs, and always returned to the same resting place on the cornice of the room. He then blinded these bats by destroying their eyes, and on again turning them into the room, their flight was as perfect as before. Afterwards, on turning loose one bat that saw, and another that was blinded, the latter followed the former in every part of its flight, passing through all the openings between the twigs with as much ac-

tivity as its leader. Mr. J. however, found afterwards, that if the ears of a blinded bat were filled with pomatum, it was no longer able to fly steadily and with exactness."

[For the above information we are chiefly indebted to the (London) Monthly Magazine for May, June, July and August last.]

## MEDICAL OBITUARY.

DIED, Sept. 16, 1798, I. B. SCANDELLA, M. D. aged 28. The fate of this gentleman was, in a remarkable degree, to be lamented. He was a native of the Venetian State. His family were opulent and high in rank. He had received the best medical education, but had consecrated his faculties to the general improvement of science, and the benefit of mankind.

Having resided for some time at London in the capacity of Secretary to the Venetian Embassy, he conceived the design of visiting America. His country's service no longer demanding his attention, he proposed to gratify a liberal curiosity in surveying the principles and structure of a rising empire.

He first arrived at Quebec, and thence took various journeys through the southern and western districts. His personal merits secured him the esteem of the persons among us, most eminent for their knowledge and talents. His candour and blameless deportment made him be regarded with peculiar tenderness by all who knew him. His chief attention was directed to agricultural improvements and projects, justly conceiving that mankind would derive most benefit from the perfection of this art.

Having spent two years in this country, and accomplished the purposes which brought him hither, he embarked for Europe in June, 1798. The vessel proving unfit for the voyage, he returned to Philadelphia, the port from which he had set out. Shortly after he came to New-York, and engaged a passage in a packet which was speedily to sail from this harbour. The detention of his baggage, which was daily expected from Philadelphia, occasioned him the loss of this opportunity. An epidemical disease had meanwhile made its appearance in both cities. Notwithstanding its greater progress and malignity in the latter city, his concern in the welfare of a helpless family, whom his departure had deprived of their only useful friend, induced him to return thither. After enduring the continual loss of rest, and exposing himself to the influence of an infected atmosphere for ten days, he set out on his return to New-York. He had scarcely arrived before symptoms of disease appeared, which, on the sixth day terminated in death.

Sept. 19, 1798, ELIHU HUBBARD SMITH, physician, one of the Editors of this work; aged 27 years. He died a victim to the late destructive epidemic. There were few who perished during that calamitous season, whose fate excited more universal regret, and whose memory will be more fondly and permanently cherished. In his domestic relations, the knowledge of his excellence is necessarily confined to few; but by those few, his conduct as a son and a brother, will ever be regarded as a model of unblemished rectitude. Indefatigable in the promotion of the true interest of those allied to him, a casual observer would be disposed to imagine his whole attention to be absorbed by this object, and that he whose affections were so ardent, and his mind so active for their good, had no leisure for the offices of friendship, and for the pursuit of general happiness. To these valuable purposes, however, no one attended with more zeal and assiduity. To those who were blessed with his friendship, and the number was by no means small, his attachment was unwavering, and his efforts for their benefit without remission. To the cause of general happiness, he devoted his abilities with no less zeal.

He was a native of Lichfield in Connecticut. The rudiments of knowledge were imbibed at this place. He entered the college of New-Haven at the early age of eleven. Here he gave proofs of intellectual energies and attainments, usually deemed incompatible with so immature an age. His education was completed under the care of the Rev. Timothy Dwight, who kept a school of considerable repute at Greenfield. He was admitted into this seminary at the age of fifteen, and left it two years after.

He then returned to Lichfield and commenced the study of medicine under the direction of his father. In the year 1791 he arrived in Philadelphia, and attended the medical lectures that are annually delivered in that city. In the succeeding year, he took up his abode, as a practitioner of physic, at Wethersfield in Connecticut. Finding little employment in this place for any but his social and moral virtues, he repaired, in the autumn of 1793, to New-York, where he remained till the time of his death.

His talents could not otherwise than slowly surmount the obstacles which were thrown in the way of his professional success by his youth, and by the want of patronage and support. His leisure, however, he devoted to the best purposes. Besides his medical pursuits, he cultivated, with zeal and success, almost every branch of literature. He was early distinguished by his attachment to the muses, which is attested by a great number of juvenile compositions. These have found their way, in different forms, to the world, and manifest a vigour of imagination and style, which

with the advantages of age and experience, would have rendered him an honour to his country.

As a physician, his loss is irreparable. He had explored, at his early age, an extent of medical learning, for which the longest lives are seldom found sufficient. His diligence and activity, his ardour and perseverance, knew no common bounds. The love of science and the impulse of philanthropy directed his whole professional career, and left little room for the calculations of emolument. He had formed vast designs of medical improvement, which embraced the whole family of mankind, were animated by the soul of benevolence, and aspired after every object of a liberal and dignified ambition. He was ripe for the highest honours of his profession; his merits were every day becoming more conspicuous, and nothing but his premature fate deprived him of that extraordinary degree of public confidence which awaited a longer continuance of his life.

In 1796 the corporation of the New-York Hospital appointed him one of the physicians of that charity. The zeal and assiduity with which he discharged the duties of his office afforded the strongest proofs of humanity, disinterestedness and public spirit.

His writings, already published, incessantly awaken regret, that the number of them is not greater. They will long do honour to his memory. They display singular diligence and acuteness of research, the talents of accurate and extensive observation, great force and precision of reasoning, and the range of a vigorous and comprehensive mind.

Though sunk into the shades of inaction and silence, his example cannot cease to offer instruction, nor fail to attract imitation. His plans for the alleviation of human misery and the advancement of human happiness, though deprived of their author and supporter, will not entirely perish. No virtuous effort is lost: no portrait of excellence is exhibited in vain.

Of this work he was one of the most zealous founders, one of the most active and ardent promoters. In the establishment of it he had fondly anticipated the diffusion of useful knowledge, the improvement of medicine, and the advancement of the interest and welfare of mankind. Long, very long, will the Medical Repository have reason to deplore the fatal stroke which terminated his labours, and extinguished the hopes of his future services.

*The following Physicians also died of the late prevailing Sickness in this City.*

Doctors Varick, Dingley, Jones (late from England), Hathaway, Young, Milligan, Andrews, Tredwell, Hicks and Brooks.

In Philadelphia, Doctors Sayre, Cooper and Biglow.

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## APPENDIX.

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### DOMESTIC.

#### ARTICLE I.

*On the Nature of Septic Gases; with an Examination of the Experiments made in France and England, to destroy Contagion, by Fumigation with Marine and Nitrous Acids; being a Comment on the Publication of J. CARMICHAEL SMYTH, M. D. To which are added, some Remarks on Nitrous Acid, and the Use of it in Syphilis. In a Letter from Mr. MITCHILL to Mr. JOHN MACLEAN, Professor of Chemistry in the College of New-Jersey, dated New-York, August 6, 1796.*

ON looking over my file of unanswered letters, I find that I have not yet made any reply to yours, from Princeton, of the 23d of June last.—Be pleased to accept my thanks for the extract of SENNEBIER's experiments on the absorption of vital air by charcoal, in the ordinary degree of atmospherical temperature.—If I mistake not, you have a demand on me for something respecting pestilential fluids; this, as far as I am able, I shall now satisfy.

Although the phosphoric acid, and the several phosphats of soda, lime, and ammoniac, have a considerable influence on the animal composition, yet, the *capital* difference of animal substances from vegetable, and every other, depends upon the presence and operation of one principle, which is septon (azote.) This is so remarkably the fact, that it might almost be said, the addition of septon to *vegetable bodies* would be sufficient to change them into *animal products*. And hence the *septic* (nitric) acid so eminently characterizes *animal* decomposition.

It seems to be an established fact, (FOURCROI, Fundamental Truths, &c. p. 187.) that in that destruction of animal substances called putrefaction, nitric (septic) acid is generated, which escapes with the other fluids formed during the same process, into the atmosphere, and proportionally diminishes the quantity of animal matter; that animal matter contributes eminently, in artificial nitre-pits, to the production of the nitric acid; and that a certain portion of water

is necessary for this putrid decomposition, as it furnishes a quantity of oxygene necessary to be combined with the azote (septon) for the composition of the septic (nitric) acid.

This septic acid, so formed, possesses caustic qualities, very readily yields to combustible bodies a portion of its oxygene, and in proportion to the quantity it parts with, becomes nitrous (septous) acid, nitrous (septic) gas, or nitrous (septous) oxyd. It is known to turn *animal substances yellow*, to *decompose ammoniac* (volatile alkali,) and to strike a reddish colour with the acid of human calculus (lithic.)

If these products are among the most common and active afforded by putrefaction, it is well worth the while to estimate what connection they have with sickly countries and seasons.—I shall take an example from Asia, because the facts are before me, which may, *mutatis mutandis*, apply to any other part of the world.

Unhealthy exhalations proceeding from the earth denuded after the subsiding of the Euphrates, are annually felt at Bussorah, a large trading town, situated about forty miles north-west of the Persian gulf, between the river and the desert. About a century ago it was almost depopulated by death and desertion. Another very severe visitation happened in 1773; and yet another alarming one in 1780. The distance between this place and Bagdat is about two hundred and fifty miles. The country along the river is remarkably flat and low, and intersected with canals after the manner of Holland. It is rich and fertile, the meadows being very luxuriant, and affording pasture for great herds of cattle. The level desert, covered for many miles with a *saline incrustation*, reaches on the Arabian side to the gates of Bussorah; and the water left by the decreasing Euphrates on this desert, and the country above and below, has always been considered as the chief cause of the pestilential distempers prevalent thereabout. Innumerable dead bodies of animals, in and about the city, contribute to render the air highly malignant and noxious; and there it was the sickness prevailed with the greatest mortality. But it is not confined to the country thereabout, for it has been known to extend from twenty miles below Bussorah, up the Euphrates to Bagdat, and thence along the Tigris to Assyria and Diarbekir, limiting itself however to a space of no great width on each side the rivers. (Transactions of a Society, &c. p. 55, and seq.) The septic vapours rising from the animal substances rotting near the surface of the earth, are properly enumerated by the inhabitants among the leading causes of those several visitations. This opinion is supported by the luxuriancy of vegetation and the fertility of much of the adjoining soil; and will be further corroborated, if, upon more diligent inquiry, it shall turn out (though this is in-

material to the argument) that the *salt* in the neighbourhood of Bussorah, or any part of it, is the *septite of pot-ash* (nitre.)

Although this septic (nitric) acid gas is so frequent and plentiful a product of putrefaction, philosophers have a long time maintained, that *alkalescency* in a particular manner characterized the putrefactive process, and that *ammoniac* was its most abundant result. As far as I can judge, this idea rests more upon belief than upon conviction; yet it has so long had the countenance of respectable authorities, and passed current for truth on the assertion of most writers who seem to have borrowed the sentiment from one another, that it must look like hardihood in me to call it in question.

Ammoniac indeed is afforded largely by animal substances; but its production from hartshorn, &c. as well as from pit-coal and soot, is always effected by a much higher degree of heat than is applied to such substances when exposed on the earth's surface to the warmest days of summer. It is produced in a range of heat high enough to destroy nitric (septic) acid, and this is far greater than the human body is ever exposed to. Heat, equal to that of fuel burning on a hearth or in an oven, destroys pestilential (septic) vapours; because, in that temperature, the oxygen of the septic compounds is attracted by the flaming fuel, and then the septon (azote) combines with hydrogen to form volatile alkali in the chimney.—I do not deny the possibility of its formation during common putrefaction; but I own I am unacquainted with sufficient proof of its being produced, under such circumstances, either very frequently, or abundantly. In maintaining, therefore, that ammoniac is so exceedingly plentiful a product of ordinary putrefaction, I cannot help thinking the modern philosophers, out of respect to great and eminent names, have been less guided by rigid experiment than governed by the *argumentum ad verecundiam*.

Or, if it should be admitted, for argument sake, that volatile alkali is so abundantly evolved as is contended, then, according to the law of chemical affinities, its causticity would be instantly destroyed by combination with carbonic acid, or it would be attracted by water, and be very easy of detection, or be neutralized or decomposed by the septic (nitric) acid; in either of which cases, it would be utterly incapacitated to float at large through the air, and be the cause or vehicle of epidemic distempers.

After all this, is it not a little surprising, that notions about the *alkaline nature of contagion* should still be uppermost in men's minds? Notwithstanding the difficulties with which the subject is entangled, they continued to believe and declare that ammoniacal gas, or something of which it is an ingredient, imparts, in times of pestilence, its venomous quality to the air. Their heads have

been so possessed by this persuasion, that fumigations with *acid vapours* have been considered, time immemorial, and especially of late, the great correctors or destroyers of contagion. To effect this, the most recent and approved practice is, to let loose the fumes of the nitrous, marine and sulphuric acids into the infected places, that they may attach themselves to the contagious atoms, and neutralize or decompose them.

Upon this principle it was that so circumspect and considerate a man as GUYTON DE MORVEAUX recommended to the physicians of France, and to the Committee of Public Health, to purify hospitals with the steams of *muviatic acid*, as being equally efficacious with the sulphuric vapours, and more volatile, diffusible and penetrating. Upon examining that gentleman's proceedings in 1773, to purify the cathedral of Dijon, which had become very highly infected, I can find nothing accomplished, which *evacuation, ventilation and careful purification* would not have done equally well, without the acid fumes. (*Instructions sur les Moyens d'Entretenir la Salubrité, &c.*) In this tract he recommends the acid gas as very well adapted to neutralize the putrid alkaline air (gaz ammoniacaux putrides) continually exhaling from the privies.

Nor do I find any thing more conclusive in favour of the peculiar advantage said to attend the *deflagration of nitre*, with an iron heater, as practised by J. CARMICHAEL SMYTH, in 1780, in the jail and hospital of Winchester, where the Spanish prisoners were dying off very rapidly, by reason of the hardships they underwent during their captivity. Does it not appear to you, that *ventilation and washing of the buildings, bathing, and walking out for the prisoners, removal of dirty beds and clothes, and clean supplies of both, exposure of the hammocks to the open sun-shine, better medical and chiro-surgical attendance, &c.* for all these things were observed, are sufficient to lessen contagion, independent of the vapours emitted from a little salt-petre? (SMYTH on the Jail Distemper, &c. p. 56, and seq.) If, after the well-directed means employed, both by MORVEAUX and SMYTH, to purify the buildings of Dijon and Winchester, they had, instead of fumigating with marine and nitrous acid gases, opened their snuff-boxes, and dispersed the powder of tobacco through the air of the apartments, they would have destroyed full as much contagion.

Since the Winchester experiment, which had been laying dormant for fifteen years, the lords of the British admiralty had a trial made in the latter part of the year 1795, on board the Union hospital ship, with the vapours emitted by salt-petre, when under decomposition, by means of the sulphuric acid. (SMYTH's Letter to EARL SPENCER, &c.) The relator gives a most flattering account of the success of the experiment, which was conducted in the presence of the sick, who were made to breathe, for some

time, the airs extricated from the nitre, while the ship's ports and scuttles were intentionally closed up to confine the medicated steams. These, when extricated from earthen pipkins and tea-cups, as Mr. KERR has very well observed, do not consist merely of highly oxygenated (nitric) septic vapour, but of a large quantity of pure respirable air, at the rate (Chaptal, Article Nitrate of Pot-ash) of twelve thousand cubic inches of oxygene gas for every pound of the salt, which may be breathed with safety, and is very unlike the suffocating steams evolved during metallic dissolutions. The good done was derived from *the vital air* thus afforded the sick, stowed away between decks, and from Mr. BASSAN, the surgeon's care, in having *the dirty linen immediately immersed in cold water on deck, and rinsed out before it was carried to the wash-house, in paying due attention to cleanliness and ventilation, and in having seven noisome privies removed from the inside of the lower deck, and two from the inside of the middle deck, to the outside of the ship.* Beneficial as this trial is said to have been, I cannot refrain from thinking, that if the same things had been attended to, excepting the septic (nitric) acid gas, the advantage experienced by the sick would have been yet more considerable, saving only the rendering the nostrils less susceptible of odours. Never was any thing more radically wrong than these proceedings.\*

Of a similar nature are the experiments made in December 1795, by Mr. MENZIES, in fumigating the Russian ships at Sheerness. (MENZIES' Report, &c.)

His Britannic Majesty's physician extraordinary will probably think me very incredulous, in withholding my assent from testimony, which, in his estimation, proves the power of *mineral acids*, particularly the *muriatic* and *nitrous*, to destroy contagion, "be-

\* This opinion is since amply confirmed. Dr. Trotter, physician to Lord Howe's fleet, has entered a formal complaint against fumigations with nitrous acid gas; affirming that "Dr. Smyth's preventative is the very substance that every intelligent officer is hourly employed to drive from the decks of his Majesty's ships." As to the experiment on board the Union hospital ship, he says there is a deception from first to last in the business. Messrs. Blair and Blanc, the commissioners for sick and wounded seamen, to whom Trotter's protest was referred, admit the noxious quality of this gas in its concentrated state, though in a diffused and dilute form, it does appear the fumes produced *any considerable inconvenience*. They allow, however, that the mortality among the Russians, and the sick at Deal, where the usual modes of prevention were practised, was less than in the Union where the nitrous fumigation was employed. In preference to this vapour, *they recommend smoking with fire and brimstone!* Since the contagion is found to progress, notwithstanding all the care and perseverance in the fumigating process, it may not only thence be inferred that nitrous vapour is prejudicial, but that the whole of these boasted experiments corroborate most powerfully the doctrine of septon. See Trotter's Med. Nautic. p. 220—248.



"yond the cavils of scepticism itself." He cannot prove the *nitrons* to be a *mineral* acid, but he can easily satisfy himself of its *animal* origin, during the putrefactive process, of which it is one of the most common, abundant and mischievous products.\* As much as I applaud Dr. SMYTH's humane exertions, and admire his zeal in this business, I still am obliged to differ from him as to the nature of contagion, and the means of fixing and decomposing it; and, as much as I doubt the possibility of destroying it by the means recommended, it pleases me to find Dr. BEDDOES rebuking Mr. DUNDAS, (Essay on the Public Merits of Mr. PITT, p. 12 and 13.) for not having directed trials to be made with those acid vapours in the British islands, fleets, and armies, where pestilence cuts down more of their soldiers and seamen than the sword of the enemy.

The wrong opinion prevalent concerning the nature of contagious exhalations has thus, you see, given rise to wrong practice, in the attempts made to destroy them. Mankind have ever acted as if the putrefaction of one body had a spreading or assimilating power, to make other things in its neighbourhood putrefy. They have not considered as fully as they ought, that, after putrefaction is past, and even during its progress, the vapours produced are, with reference to inanimate substances at least, highly *antiputrescent*. For instance, *fixed air*, so copiously extricated at such times, has just the reverse of a putrescent operation; and the same is true of septic (nitric) *acid*, and *volatile alkali*. Indeed, whatever the prevailing notion on this head may be, it is impossible that substances which have undergone putrefaction should still be putrid: as well might it be said, that bodies which have undergone combustion are yet a burning. Both the one and the other of these processes resolve the complex structure of plants and animals into new and simpler combinations of elementary particles; and to say, that the products of putrefaction possess a power to *putrefy every thing near them*, has just as much sense and propriety in it, as to affirm, that the products of inflammation must always have a *tendency to inflame* any thing they touch. The fact is, that substances which have passed the fire are *incombustible* afterwards; and matters, which have undergone putrefaction, are thenceforward *antiputrescent*. Pestilential fluids being thus the offspring of a *septic* process, thence derive their name and title; but they are *antiseptic* in their effects, and undermine health, and

\* In addition to the authorities I have heretofore cited to this point, it may not be amiss to refer this gentleman to ERKLEBEN's *Anfangsgründe der Chemie*, published at Göttingen in 1775. That author expressly ranks this acid among the products of animal and vegetable putrefaction. (§ 189. § 302.)

take away life, by impeding respiration, interfering with digestion, mingling themselves with the blood, stimulating the heart excessively, &c. and not by any operation on the living body, resembling the vulgar notion of putrescency.

If these views of this subject are right, then it should follow, that substances which have undergone the putrefactive process would be preventives of putrefaction in dead animal matter. This is found to be really the case. In the seventh chapter of ALEXANDER'S *Experimental Inquiry*, (p. 62, and seq.) concerning the causes that have been generally said to produce putrid diseases, it is proved, that the most *nasty* and *offensive* water from ditches, puddles and sewers, possessed a power of preserving beef and mutton from putrefaction much longer than *pure* water. This was found to be true of the water of the *North-Loch*, the ditches in the *meadows*, and the *drainings* from the *Cannongate* of Edinburgh, and of the water of *St. James's Park* and *Fleet-Ditch* in London; waters which nobody who has observed whence they were taken, will doubt of containing putrid matter enough to render them fit subjects for these experiments! Raw meats put to macerate in these liquids, and hung in their vapour, were universally found by far less liable to putrefaction than when exposed to common air and common water.

Yet this author fell into the prevailing mistake, as to the interpretation and application of his own experiments. For as the effects of putrid water and its exhalations were antiseptic upon flesh, he concluded that such antiseptic substances could not be the cause of what are called putrid intermittents, dysenteries, &c. &c.

But ALEXANDER had not learned that the term "putrid" was very unhappily chosen, and most unphilosophically applied; to designate diseases; nor that the distempers called by that name were truly caused by the external and internal operation of an exceedingly powerful antiseptic.

Is it not passing strange, that, after all this, and after CRONSTEDT'S declaration that it is one of the characteristics of the nitric acid (1 *Mineralogy*, p. 287.) to "act very powerfully on all animal and vegetable substances," that it should ever have been thought of as a destroyer of infection, and not a destroyer of life?

With many good wishes for your welfare, believe me to be truly yours,

SAMUEL L. MITCHILL.

Professor MACLEAN, Princeton.

P. S. Yet this has been proposed and practised with a view to overcome contagion when lurking in the living body, as well as when floating in the air. The public has been frequently addressed of late on the subject of nitric acid employed as a remedy

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in relieving and curing the venereal disease, and in bettering the state of the constitution in sundry other complaints. It is cried up as a much more efficacious remedy than quick-silver, and as likely to supplant prescriptions of which that metal constitutes a part, entirely. The declarations in favour of opium as a sovereign remedy for syphilis, were not more positive in New-York, towards the close of the revolutionary war, among some of the physicians and surgeons of the British garrison, than the assertions appear to be at this time among some of their medical managers of hospitals in the East-Indies and in England, in favour of the nitric acid. But opium, like sarsaparilla, guaicum, lobelia, and mercury, often disappointed the expectations of its prescribers, and has long since declined in its reputation as a specific. What good the thing they call nitric acid is capable of doing, and how long it will continue to work wonderful cures, time and experience must determine. They who recommend it most warmly, already candidly allow, that in a number of instances, it has unaccountably failed.

In all cases whatever, it is highly necessary to have a precise notion of every thing to which we give a name. Unless this is duly attended to, uncertainty and error will insinuate themselves into all our reasoning. We shall be diverted from the plain path of fact, and be constantly deluded by the phantom of words. I have had occasion, in former discussions, to shew how deeply mankind had been deceived by adopting improper terms on the subjects of *putrefaction*, *inflammation*, and *fever*. I find it necessary, at this time, to point out some mistakes arising from the confounding several distinct things under the names of *nitrous* or *nitric* acid.

In every instance where I have spoken of the nitrous or nitric acid, or what in the reformed Nomenclature is denominated septonous and septic acid, I meant a mere chemical union of septon (azote) with oxygene, diluted with more or less of water, and existing in a liquid or æriform state, as happens in and about corrupting masses of organized substances wherein the acid of putrefaction is formed. The effluvia from this particular product, is what I have considered to be the very matter of pestilential air. But because this fluid and the gas into which it may be evaporated, sometimes meet with pot-ash and form the salt called nitre, the acid has been most illogically designated by appellations derived from that compound salt. What I understand by the septic acid is a production which has never been united with pot-ash at all, nor been changed from its original constitution by admixture with other acids or substances during the process of separation from that alkaline basis. The acid separated by art from the fixed vegetable alkali, has been incautiously supposed to be the same which is fabricated in the laboratory of nature. By considering with minuteness the operation for obtaining the nitrous and nitric

acids, and the single, double, and compound aqua fortis of the shops and of commerce, it will instantly appear that pure septic (nitric) acid is very rarely procured, and that from the very nature of the process, it must be adulterated with some foreign ingredient.

What tricks may be played by trading chemists in the preparation of this acid, I pretend not to know. From parcels of it bought by myself for experiments, I can declare it to be frequently vitiated in so considerable a degree, as to be totally unfit for almost the commonest use. It certainly acquires no purity by passing through the hands of apothecaries and druggists. The frauds and impositions constantly practised by the dealers in drugs and medicines, who in America are under no controul from inspection by public authority, are dismal and shocking; and the persons who swallow the compositions made of such vile materials, must abide by the consequences.

But supposing the manufacturer to be scrupulously exact in preparing the nitrous acid according to the most approved receipts, and the wholesale trader and retail dealer to keep it with the utmost care afterwards, even the acid obtained by most of the processes is and must be very different from the original and genuine acid of putrefaction:

For example; the College of Physicians of Edinburgh direct the nitrous acid to be prepared by pouring a pound of sulphuric acid upon two pounds of purified salt-petre in a glass-retort, and distilling in a sand-heat, gradually increased until the iron-sand pot becomes obscurely red-hot. The London College order the process to be conducted in nearly the same way, without deviating in any material circumstance. And these seem to be but repetitions of the method pursued long ago by GLAUBER in Holland, and followed by the Dutch artists to the present time. In performing these operations, there is generally a surplusage of sulphuric acid, which being not neutralized by the pot-ash, rises in vapour, and passes over into the receiver with the nitrous. Thus the nitrous acid of Scotch, English and Dutch preparation is, in reality, not the pure material, but a true (nitro-vitriolic) sulphureo-septic acid.

What is true of the *nitrous acid* is more strongly applicable to *aqua fortis*, in the making of which, as colcothar and sulphate of iron (copperas) are employed, there is a necessity for a more violent heat than in the before-mentioned processes; whereby the acid produced is exceedingly impure, and indeed acknowledged to be unfit for pharmaceutical purposes. So much does the sulphur predominate, that like the former, only in a more considerable degree, this is a sulphureo-septic acid, wherein oxygene is united to a double basis of sulphur and septon (azote). And such is the disposition of the two acids to combine during the operation, that how carefully soever the nitre is purified, and how skilfully

soever the distillation is performed, the nitric acid procured will always be charged with more or less of the sulphuric; and vice versâ, when nitre is employed in manufactories of sulphuric acid to assist the combustion of the brimstone, the sulphuric acid is always mingled with a portion of the nitrous. Upon such mixtures of acids are our experiments generally made! Such is the composition of the greater part of the sulphuric and nitric acids prescribed for the sick! And upon such a frail and sandy foundation, have men undertaken to reason and philosophize! The fallacy of deductions from such premises, if intended to refer to pure sulphuric or pure nitrous acid, is obvious enough to strike the attention of any boy who can read his dispensatory.

How many of the experiments published have been made with *pure* nitric acid does not appear. But as the acid, from the accounts of the experimenters themselves, appears to be prepared by the common processes, there can be no doubt, that the unmixed and unadulterated nitric acid has never yet been prescribed. In the forms in which the substance called by that name has been administered, its peculiar activity and poignancy have been blunted by its combination with brimstone or something else.

All chemical union implies a change of qualities in the substances combined. The combination of the unknown basis of the muriatic acid with the nitrous, in compound aqua fortis and in aqua regia, imparts to those preparations a variety of new properties. Alcohol does the like in the dulcified spirit of nitre. And shall the union of sulphur with septous (nitrous) acid not work a sensible change in its affinities and attractions?

The reader of the cases reported by Messrs. Scott, Baynton, and Hammick, is therefore to consider that the *pure and genuine septic acid*, as afforded by nature in putrefactive processes, has never been prescribed by them to their patients. Whatever of good or harm has been done by them when they administered their acids, in venereal cases, is the effect of the nitrous acid combined with more or less of the sulphuric or muriatic acid, or perhaps with both. The nitro-muriatic, the nitro-sulphuric, and the nitro-sulphureo-muriatic acids, are the weapons they have armed themselves with, to conquer the formidable power of syphilis.

The septic acid is more prone than any to act upon other substances. Its attractions are more various and diversified. They embrace a far wider circle of objects.\* So general are its affinities, that in the course of ordinary occurrence there is scarcely any thing except silicious earth, upon which it does not operate. Some of the things it meets with, as lime, clay, and alkalis, &c.

\* Kirwan (2 Elements of Mineralogy, p. 3.) believes it never has been found in a *free state*, except in charnels perhaps, and privies.



neutralize it entirely; others, as sulphur, alkohol, &c. neutralize it partially; others again, as fire, vegetation, &c. destroy it completely. From this remarkable disposition of almost every thing on earth to modify the acid of putrefaction, it never can retain, for a long time, its native and primitive character. Its characteristic virulence exists only near the place of its production, and that commonly but for a short time. Almost every thing it touches in its progress through air, earth, and water, affects its constitution very materially, by adding something to it, or depriving it of something. From the vast number and strength of its attractions, it is almost impossible to procure it artificially, in the precise forms in which putrefaction and lightning engender it. And happy for the animated part of the creation it is, that its pestilential vapours may be checked, blunted, and counteracted in so many ways. In surveying the politics of nature, I observe scarcely any instance where the means seem adapted to the end with more consummate skill and masterly contrivance than in this.

One may thus comprehend how the nitric acid of trade and of the shops, which in truth is a nitro-sulphuric acid, may be taken into the mouth and stomach, not only without detriment, but oftentimes with benefit. The poison it contains, like the poison of the viper, small-pox, arsenic, and other poisons, is quelled by the gastric juice, provided the quantity swallowed be not too large, and by the other contents and the concoctive powers of the stomach. Yet even here, notwithstanding such clogs and restraints, the ferocity of its nature now and then breaks out, and soreness of the mouth and gums, sickness of the stomach, griping pains of the belly, and mucous and bloody stools, are some of the feeblenesses of its virulence. Nor is there more difficulty in understanding, wherefore the nitro-sulphureous vapours of aqua fortis to which engravers in copper are exposed, do not affect their constitutions, with the malignity peculiar to the almost unmixed septic acid effluvia issuing from the abdomen of putrifying corpses, and occupying the long-closed vaults wherein they have laid.

With such interpretation as this ought every person to be instructed who reasons about the effects of that nitrous acid in medicine, engraving, silversmith's work, dying, and the other arts.

According to the kinds and numbers of things blended with septic acid, and the laxity or intenseness of their coherence, will its effects upon living bodies and substances of all sorts be modified. Scarcely can any two parcels or samples of it be expected to have exactly the same composition, or to produce precisely similar effects. Every gradation of mixture produces a correspondent degree of variation in its operation; and every one of these, endless almost as they are, alters the original virulence of the naked acid.

Is it easy to foretel what will happen to the prescribers of nitric acid in syphilis. There will be different results from their experiments. They will dispute and contradict one another. In the mean time, the fallacy of the whole matter will become apparent, and the nitric acid, like a number of other celebrated specifics, gradually lose its ill-gotten reputation, and sink into neglect. Its advocates may extol it as much as they please, and force it into notice, but they cannot thereby alter the rules of chemical action, nor change the laws of nature.

But the discussion will be eminently serviceable to science. Our understanding is such as to derive profit from the observation of error, as well as the exhibition of truth. I hope, therefore, the trials with this remedy will be continued until every body is quite satisfied. It will thereby be determined *what is the true doctrine*, and this will eventually be established on the ruins of all badly-constructed systems.

December 14, 1797.

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## ARTICLE II.

On SEPTON (*Azote*) and its Compounds, as they operate on Plants as Food, and on Animals as Poison: intended as a Supplement to Mr. KIRWAN's Pamphlet on Manures. In a Letter to the Rev. Dr. HENRY MUHLENBERG, of Lancaster, Pennsylvania, from Mr. MITCHELL, of New-York, dated October 24, 1796.

THE letter which you wrote me from Lancaster, on the sixth of June, would not have remained unanswered so long, had I not been engaged in making a tour through the state of New-York, by an appointment of our Agricultural Society, which I was prevailed upon to accept. You observe, that gypsum has been found in Pennsylvania, near Lake Erie, in large quantity; and I have the satisfaction to inform you, I have received beautiful specimens of transparent lamellated gypsum, said to be found plentifully in Onondaga county, in the state of New-York. The powder of gypsum does wonders in the interior part of our country; for I know not whether I should be extravagant if I told you, that the proper use of it *doubled the productions* of the land.

But I am not disposed, at this time, to discuss the subject of gypsum with you. There is another manure, which, though exceedingly abundant and active, has been strangely overlooked by most persons. On account of its connection with the life and health of plants, and the diseases and death of animals, it merits an eminent share of attention. Some observations and reflections on this sub-

ject, which occurred to me during my late expedition, shall form the remaining part of this reply to your last.

In my letter to Chancellor LIVINGSTON, of February 20, 1796, an attempt was made to show that plants had the power of destroying pestilential fluids, and of rendering the atmosphere, which had been contaminated by them, healthy. It was stated, that the septon (azote) was taken up as a nutrient material, and retained in the vegetable economy, while the oxygene was discharged, and, in company with caloric and light, renewed the respirable portion of the atmosphere.

I shall now prosecute the inquiry a little further, and go into some practical details relative to this sort of manure. This task I the more readily undertake, as I find the experienced and accurate Mr. KIRWAN, a copy of whose valuable publication has been just sent us from the British Board of Agriculture, has made no mention whatever of the septous principle (azote) as a manure. (The Manures most applicable to the various Sorts of Soils, &c. London. 1796.) This letter, then, may be considered as a supplement to Mr. KIRWAN's pamphlet.

What I have to remark will be comprised under three heads.

1. That animal manures contain septon (azote). 2. That plants, nourished by such manures, contain it also: and, 3dly. That hence may be derived a principle elucidating the use and operation of such manures.

1. The whole history of decaying animal substances tends to prove the abundance of septic (azotic, nitric) ingredients they afford. The urine and excrements of neat-cattle and sheep, the soakings of dunghills, the earth of horse-stables and cow-houses, the soil of graves, and, generally speaking, animal relics, and putrefying carcasses of all kinds, afford, every one of them, septic (nitric) acid. This acid is composed of septon (azote) and oxygene. Water aids the formation of this acid, by promoting intestine motion among the decaying materials, and by its own decomposition furnishing any quantity of the principle of acidity which may be wanted. And, when formed, water acts as a vehicle to convey and apply it to the various substances it meets with.

Accordingly, this product of animal decomposition being yielded plentifully by the materials collected in yards and along streets, filters through the earth in cities, and taints the waters of their wells; most of which, especially in large and long settled spots, are found, by experiment, to contain it, either separate or combined with fixed vegetable alkali, in the form of a *septite of pot-ash* (nitre). It must be hence apparent, that the water of such wells ought not to be employed for the domestic uses of washing, cooking, or drinking; but that, in well-regulated societies, aqueducts should be constructed, for bringing water to towns, from springs

or sources considerably distant. This branch of public economy, which was so diligently attended to by the ancient Romans, is considered, by American municipalities, as of small importance. They had rather offer a yearly sacrifice of hundreds of citizens to the demon of pestilence, than make the most easy and obvious of all public provisions for washing away such pollution. I have often thought the sixth labour of a great DEITY of ANTIQUITY very applicable to the considerable towns in the United States, which may be considered as so many AUGEAN stables, requiring the waters of a river to be poured through, in order to cleanse them.

In like manner *stagnant lakes* are vitiated (BERGMAN. *Analys. Aquar.* § 4.) by animal and vegetable products; while *ponds*, *marshes* and *puddles* are still more highly impregnated with similar extractive and septic matter. The fertilizing effect of such waters on plants, as far as the *septic principle* is concerned, may be easily observed in meadows moistened by these fluids, where grasses and other plants possess great luxuriance. The unhealthy operation of such exhalations on animals is observable, when, after the evaporation of those waters, too great a proportion of septic vapour rises for the neighbouring plants to decompose. Our unditched morasses, and undrained swamps, reeking occasionally with pestilential steams, would remind me, if I had a disposition to indulge classical allusion, of the need there is of another HERCULES to overcome another ACHELÖUS.

The connection there is between malignant distempers and dirtiness has been already remarked by TISSOT, (*Avis au Peuple*, &c. ch. ii. § 7 and 8.) among the peasantry of Europe. Septic substances, the offal of slaughtered animals, the refuse of house-keeping, are, when mingled in due quantity with the soil, justly ranked among the best fertilizers. The impregnation of land, around houses and barns long occupied with such materials, is the acknowledged cause of its superior productiveness. While these manures are mixed with earth in such quantity as to promote and not overpower vegetable life, their noxious effluvia are repressed, or their virulence counteracted, by the mediation of plants. The instrumentality of these classes of animated beings seems to be intended to keep the great balance of nature in equipoise, and prevent either scale being overloaded with materials destructive of animal life. But it, nevertheless, sometimes happens, that in cellars, and around country dwellings, in pig-styes and cow-pens near the house, there are accumulated great quantities of excrementitious and corrupting substances, which, if seasonably carted away, tend eminently to fertilize the fields, and promote the growth of vegetables; while, at the same time, by remaining, they render the house foul and unhealthy, by the extrication of *septic* VA-

poors. Neatness and elegance are thus found to be as conducive to good health as to good husbandry. On considering the matter, it appears evident, that the effluvia from the neighbourhood of dirty cottages and mean huts, in the country, are of a like nature with the pestilential fumes which insinuate themselves into foul and unventilated tenements in cities; and the reason is apparent, wherefore, as penury is generally associated with ignorance and nastiness, and often with indolence, these distempers rage with such tremendous violence among the poor.

When I see a farmer permit such unwholesome substances to collect around his habitation I cannot help reflecting on the danger which awaits him. The manure, which ought to have been carried away and spread over his lots, serves, as it lays, but to make his family sickly, to disable his labourers, and lead him to the dubious and expensive routine of physic; and, as in common life as well as in logic, one blunder leads to another, the want of crops, and the consequent failure of income, drive him to mortgages, judgments, and executions, those fatal expedients of law.

In like manner do I lament the indiscretion of tenants contending in our cities, which of them shall obtain, at a high rent, from the distant landlord, *a pestilential stand for business!* With the view of bettering themselves, they venture, at all hazards, amidst the poisonous exhalations of the neighbourhood. By and by they are visited by distempers; and as they are honest and sober citizens, having no uneasy conscience to reproach them for their sins, they piously consider this affliction as a monition from Heaven to try their virtue. Their sense of constancy and firmness forbids them to fly from the scourge of the Lord, and thus they religiously stick to the infected spot! What is the true interpretation of such conduct, but that both the farmer and the trader, obstinately persisting in the means of self-destruction, are guilty of a sort of suicide?

It is a fact, long ago established, that great cities are the graves of the human species. It is a truth of almost equal importance, that the foul habitations of country people are nurseries of pestilential distempers. The street-manure of cities consists of pretty much the same materials with the yard-manure collected about farm-houses. Both are unhealthy for a similar reason. The costly exertions of the cit, to amass septic materials of all kinds, and from all quarters, to found his building upon, amounts to the same thing with the supineness of the rustic sluggard, who neglects to remove them from his door.

If further proof was wanting of the real nature of these manures, it would be easy to state, that, besides the affinity of septic compounds with water, they have a strong attraction for other bodies. With pot-ash and soda, of which large quantities are daily poured into the streets with the soap-suds employed in washing, and from



other sources, the septic acid forms the septites of pot-ash (common salt-petre) and of soda (cubic nitre.) With lime, which, from measuring, carting and building, is sprinkled plentifully along the streets, as well as in the mortar of walls and the cielings of rooms, it forms the septite of lime (calcarious nitre.) And with clay it forms the septite of agril (nitrite of alumine.) By these several ways are pestilential vapours kept down and prevented from exercising their deadly effects upon animals, except in cases where they are produced in quantity too great for the enumerated substances, and others with which they have a proneness to combine, to attach and neutralize.

2. There will be no great difficulty in showing, that septon (azote) is one of the component materials of certain vegetables. If it can be made evident what plants especially abound with it, we shall be furnished with a clew, leading us to the true use of the manures containing it. From an analysis of plants we have become acquainted with several of their component parts, and thence are enabled to form some judgment concerning the qualities of the manure best adapted to such and such particular kinds. There is good reason to believe, that particular manures ought to contain ingredients of the same nature and quality with those which the plants so manured are found, by analysis, to consist of. By proceeding in this manner, there can be rarely a mistake made in the application of manure. It is observable in the order of creation, that certain vegetable bodies approach more near than others towards animal nature. The presence of septon (azote) is the circumstance in the composition of organized beings, which particularly denotes animality, or the approximation to it. Septic manures being of animal derivation, ought, therefore, if they entered into the constitution of plants, to make such as are nourished by them take on somewhat of an animal nature. Let us now examine how this principle accords with facts. A familiar example may be taken from *wheat*. Wheat is most benefited by manures that contain septon. *Street manure*, *door dirt*, and *well-mixed barn yard compost*, all of which abound with septon, are among the best manures for that vegetable. And the efficacy of wood-ashes in making ground capable of producing great crops of that grain, is probably owing, if modern conjecture is true, to the septon (azote) composing a part of the alkali it contains. Some of the *swamp manures* will also produce good harvests of wheat; but others of them, though they cause a sufficient growth of straw, fail to fill the seed in the ear. The straw is large and heavy enough, but the grain is scanty and light. The reason appears to be this: Where the swamp manures happen to be charged with the septic matters, derived from animals, or from vegetable substances that approach toward animal nature, they will produce

plentiful crops of wheat; but when they consist merely of decayed plants, they are incapable of elaborating the grain in the head. The cause of this can easily be investigated by attending to the analysis of wheat. Mr. PARMENTIER (Le Pairfait Boulanger, &c. page 26.) assures us of the presence of septon in the *mucons* part of meal; and he affirms, that the *glutinous* portion affords products quite similar to animal substances. (Ibid. p. 24.) If, then, the land upon which wheat grows contains a scanty quantity of septon, the seed will be poor and light in proportion to the deficiency of that article of food in the soil. Yet, in this very ground, the roots of turnips and radishes may thrive exceedingly; and so may other plants that do not employ septon as an article of their diet.

Similar reasoning applies to Indian corn or the grains of the *zea mays*. The conclusion does not, however, rest upon theoretical probability. MARABELLI, in 1793, published an analysis of this substance, (Commentar. de Rebus, &c. tom. xxxvi. p. 46t.) which proves it to afford *septous acid*. His words are, "residuum, post expressionem succi coctione extractum, præbet *acidum nitrosum*, &c. &c." The basis of this acid, septon, was doubtless derived from the soil where the maize grew. A luminous fact! which will be found to be true of *all the cerealia*.

The same views of the subject inform us why *funguses* grow up on dunghills and in pasture grounds, where the excrementitious discharges of animals are dropped. That they are nourished by septon appears from their analysis, which proves them to contain it.

Although these considerations might appear conclusive as to this point, the evidence does not rest here. Facts of a very striking nature present themselves relative to the growth of plants on nitrous (septic) soils. In general, vegetables growing in such soils are remarked to become very large, and to get ripe early. And as they are soon ripe, they are soon rotten. *Tobacco*, in such situations, is very luxuriant, and quickly matures, but is very apt to rot on its passage from America to Europe; and too much septon in it seems to give it the bad quality of going out very readily after it is set on fire for smoking. *Potatoes* grow rapidly and large, but will keep only for a short time. *Sugar-canes* grow very rank, and are soon fit for cropping, but must be manufactured speedily, or they spoil; and even with the earliest care and best attention, afford, under such circumstances, sugar and molasses of a quality below middling. (Stubbs. 3. Lowthrop's Abridgement, p. 554.) *Cabbages*, for the same cause, ripen too soon, corrupt in the head, and last not long enough for winter use.

What PLINY relates on the cultivation of the Helvenac vine, (Nat. His. L. xiv. de gener. Vitium.) confirms the same prin-

ciple. "There is no vine," says he, "which is less accommodated to the soil of Italy; the grape which it bears is clear, small, and very apt to rot; and the wine it affords will not last longer than a year; but there is no plant that thrives better in poor land."

If these ideas are just, then the decay of such vegetable substances ought to be attended, under certain circumstances, with the production of septic or pestilential fluids. This too is the fact. *Cabbages*, putrefying in a cellar, have been known to render a house unhealthy. Corrupted *coffee* has been charged with emitting pestilential effluvia enough to desolate a neighbourhood. The like may happen from rotten *flax*, *hemp*, *potatoes*, *onions*, and, in short, all other plants which have derived septon, or the principle of putridity, from the soil in which they grew. It is probable, that rotten *wheat* contributed, with other causes, to render the vicinity of a certain store in New-York, during the pestilence of 1795, peculiarly unwholesome. The dispute, whether pestilential effluvia proceed from animal or vegetable putrefaction, seems thus reduced to its proper principle. When vegetables, containing septon, go into putrefactive decay, mischievous gases may exhale from them, having the qualities of animal productions. When this is not the case, collections of putrescent vegetable matter, as in peat-mosses and bogs of turf, emit no particularly offensive miasma to vitiate the surrounding air; but, on the contrary, the water draining from such places is often potable and good.

3dly. There now occurs an obvious explanation of one of the operations of lime as a manure, when mingled with dung and soil. The common opinion has been, that it promoted the putrefactive process of animal and vegetable matters, and thus made them more fit for absorption and nutrition. This may be the case: but there is yet another effect which has not been generally attended to. Calcareous earth combines with the septic acid into a septite of lime (calcareous nitre) and thus becomes a very valuable manure; and, at the same time, by its attractive power, it prevents the evaporation of that fluid in the form of pestilential steam. I believe, likewise, it has a further use in retaining the septic substances longer on the land, and thereby lengthening out their fertilizing effect. Old walls and rubbish, abounding with the septite of lime, frequently answer valuable purposes, as manures. Lime, in its simple state, destroys vegetation. Before it is fit to promote the growth of plants, it must be combined with some neutralizer. Its combination with carbonic acid (fixed air) is the most frequent; but in dunghills, and heaps of manure, a more common compound is formed with the septic (nitric) acid. By this connection, both the lime and the acid are deprived of their causti-

city, and preserved upon the land a sufficient duration of time, to undergo that gradual decomposition, by the vegetable economy and other causes, which favours the production and growth of plants.

How far the other septites may be operative as manures is not wholly ascertained. Doubtless they possess no inconsiderable activity. It seems to be agreed among the learned, that the word translated 'nitre' in the bible (PROV. xxv. 20. JEREM. ii. 22.) does not mean the salt-petre of the moderns, but the mineral alkali (soda.) Yet some ambiguity besets the text of *Virgil* (1. Georgic. v. 194.) as to the precise thing he meant by the "nitro" sometimes employed with the lees of oil as a steep to prepare seed for sowing.—The following facts will render it probable that septic or pestilential fluids are sometimes very abundant in the atmosphere, and disposed to combine readily with such substances as have an attraction for them; and that consequently in the cases just referred to the *nitre* might have been a *septite*.

"Nitro," says *Querlon*, (Not. ad Plin. Nat. Hist. l. xxi. chap. 10.) "is a salt belonging to all the parts of the terrestrial globe, inhabited by men, by animals, or even by *insects*; for I have often extracted very pure salt-petre from the little holes in walls which served as lurking-places for *spiders*.—Animal exhalation seems to be the means employed by nature to produce nitre, which, on that account, is never produced either far below or above the surface of the earth; and usually has for its matrix rotten plaster, similar calcarious matters," &c.

In many parts of the state of New-York, much of the fixed vegetable alkali is extracted from wood-ashes. The interior country, as well as the capital, is occasionally severely afflicted with pestilential distempers, as was the case in the summer and autumn of the current year. At some of the pot-ash works, such was the amount of the septic fluids in the surrounding air during this season, that the alkali concreting on the outsides of the lutch-tubs, from the leakage through the staves, attracted enough of them to convert it to salt-petre. Such a fact is of the utmost weight and importance, and of itself establishes the basis of most interesting deductions.

From the copiousness of septic products, it is apparent they incommode animal life wherever they are sufficiently concentrated. They become incorporated with metallic, earthy, and saline bodies, wherever they can find them.\* They also extend their influence to unknown limits over the vegetable creation.

\* This goes so far, as CHAPTAL has shewn in his *Memoire sur la Decomposition à Froid des sels Vitrioliques par l'Acide Nitreux*, (1 Mem. de Chimie, p. 47.) that nitrous acid will, even in the cold, displace the sulphuric acid, and decompose vitriolated tartar, Glauber's salt, copperas and white-vitriol.

On this latter subject it is worth the while to cite the respectable opinion of Signior SEGUIER, extracted from his letter of the 11th of August, 1754: "Io ho osservato pui di una volta un "pero, ch' e nel mio orticello, il quale avendo le foglie verdi, e "senza macchie, sono poi diventate tutte macchiate di gialla in "una notte, ed ò questo sempre attribuito a gocce di rugiada "TROPPO NITROSE, che vi sono cadute sopra:" "I have more "than once observed a pear-tree, in my garden, whose leaves "being green and spotless, have become all spotted with yellow in one night, which I have always ascribed to drops of "dew, of a TOO NITROUS QUALITY, which had fallen upon "them." And Count GINANNI refers to the popular opinion of the VOLATILE OR SUBTIL NITRE OF THE AIR, sometimes being so corrosive, penetrating, saline and acrimonious, as to impart to the dew a power of causing disorders, and particularly *rust*, in wheat. (Viene accusato principalmente il Nitro Volatile o Sottile del Aria, &c. onde la Rugiada viziazi, &c. Delle Malattie del Grano in Erba, par. iii. cap. 1. p. 292.) I have only to add, that my own observations tend to the same conclusion.

The atmosphere thus becomes impregnated with nitrous (septon) acid particles. How? The Abbé FONTANA has told his readers, as long ago as 1776, when his physical researches were published in Paris—Hear him: "Il paroît apres tout qu'on ne "peut plus douter que l'air commun; quoiqu'il se trouve toujours "uni avec le phlogistique de l'atmosphère, ne soit composé dans "l'origine par l'acide nitreux depouillé de sa quantité naturelle "de phlogistique; et conséquemment il paroît encore naturelle "que l'air commun puisse, dans plusieurs circonstances, se DÉNATURER OU SE COMBINER DUNE TELLE MANIÈRE QU'IL "PUISSE CONSTITUER DE NOUVEAU, L'ACIDE NITREUX, "DONT IL A ÉTÉ FORMÉ; DE SORTE QUE L'ACIDE NITREUX "POURROIT ÊTRE COMPOSÉ DE L'AIR COMMUN MODIFIÉ "DANS L'ATMOSPHÈRE." (Recherches, &c. p. 162.) Nitrous acid, he observes, may be composed of common air, modified in the atmosphere. So it may be composed of the bases of these airs, septon and oxygene, running into union on the putrefactive decay of organized substances. I might quote more opinions.

Here, however, I must conclude, with soliciting your assistance to ascertain some points which appear to me of no inconsiderable importance, both when considered as speculations in science, and as viewed in connection with the practical arts of agriculture and medicine. What are the effects wrought upon plants by the septites of pot-ash (common nitre), clay (alumen nitrosus), and soda (cubic nitre), considered as manures?

As I offer to join heart and hand with you in pursuing these



inquiries, and have made some arrangements on my farm for the purpose, it is almost superfluous in me to observe, that I remain, with unabated esteem,

Yours, &c.

SAMUEL L. MITCHILL.

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### ARTICLE III.

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*The following Account of Dissections of Bodies dead of the late Malignant Epidemic at Boston, is so interesting, that we think proper to republish it.*

Boston, September 8, 1798.

THE great advantage to be derived to mankind from an inspection of the bodies of such as have died of so formidable an epidemic as the yellow fever, must be obvious to all. The following cases of dissection may throw some light on the nature of the disease as it prevails in this town, and may, we hope, be of some use, in investigating the treatment best adapted to the purpose of checking or suppressing its destructive ravages.

The first case was of a man, who died on the sixth day from the seizure, and as no application was made to a physician till the first stage of the disease had nearly expired, the state of the organs may be considered in a great measure as the natural effect of the disease, undisturbed by art.

In the cavity of the chest, the lungs were remarkably affected—they contained an uncommon quantity of dark blood in their vessels, which rendered them apparently more dense than usual; the vesicles not being distended with air, and their substance consequently less compressible than usual. The posterior part of both lobes was extremely livid, and in the cavities of the thorax was contained a large portion of extravasated blood, firmly coagulated, to the quantity of eight or ten ounces, as nearly as could be estimated.

The pericardium contained as much as two or three ounces of fluid blood. The heart was of its usual size; but the coronary veins were so distended with blood, as to exhibit the appearance of a most successful injection. In the cavity of the abdomen, the part most conspicuously morbid was the liver. This organ appeared to be much inflamed both on its convex and concave sur-

face; its substance was much indurated, and, on cutting, resembled in colour, a boiled liver. The gall-bladder was contracted to a very small size, and contained not more than a quarter of an ounce of a thick, glutinous, and almost inspissated substance, resembling pitch. There were no marks of any considerable quantity of the bile having been lately contained in the sack, and none of the neighbouring parts had the least tinge that denoted its presence. On cutting through the ductus communis choledochus, no bile issued from the aperture; the hepatic duct had also evidently for some time ceased to transmit its fluid from the liver. The stomach exhibited an enormous distension of its veins, especially round the pylorus, and had every mark of great inflammation. The intestines, in general, were in the same state with the stomach; the smaller were considerably distended, and the larger contracted. The spleen was uncommonly turgid, but in other respects in its natural state. The peritonæum on the under side of the diaphragm, and the pleura on the upper, bore the vestiges of inflammation, but no other parts of those membranes appeared to have been diseased.

The omentum was considerably thickened, and from the turgescence of its blood-vessels, of a colour unusually dark. There were no appearances in the thoracic or abdominal viscera, of supuration, nor was any degree of fetor perceived to arise from them; nor was there the least mark of incipient putrefaction in any part of the body. It may be proper to remark on this case, that in every stage of the disease, the discharges from the bowels were of the colour and consistence of water gruel, excepting a few evacuations of a matter similar to what is called the black vomit; and that this usually fatal symptom had also preceded the patient's death on the fourth day of the disease.

The second case. The subject of this dissection was the body of a person who died on the 12th day from the attack, with symptoms of the mixed kind; a remission of the disease had taken place, at the period usually critical, upon which, on the sixth day, a delirium ensued, and continued to the moment of fatal termination.

On opening the cranium, the brain was found to have its vessels astonishingly distended with blood, an ounce or two of serum was effused between the dura and pia mater. Under the sagittal suture, and by the sides of the longitudinal sinus, where the large veins terminate in that cavity, a lymphatic band, about an inch wide, extending nearly the whole length of the sinus, was formed by the coagulable lymph, which had been effused from the blood-vessels, by the violence of the preceding inflammation, and this substance had served as a medium of adhesion, between the dura and pia mater in that part.

The lungs adhered very firmly to the pleura on the right side, and appeared posteriorly to have been much inflamed, and in some parts to be indurated in portions of about the size of a pigeon's egg. The left lobe adhered so firmly to the pleura, as not to be separated but by tearing the substance of the lungs which here appeared extremely diseased, and in a state of actual suppuration throughout its whole substance. The heart was in its natural state. The liver was much enlarged, and in a state that denoted a high degree of inflammation; the convex surface of the great lobe near the gall-bladder exhibiting marks of extravasation, as if violently contused. The gall-bladder was full of bile, and the ducts pervious.

The stomach was nearly in its natural state; but, on the inside, the surface of the villous coat was besmeared with a matter which seemed to be of the same nature with the black vomit, though nothing of this kind had been ejected in the course of the disease.

The duodenum was much inflamed for several inches from its commencement at the stomach, and the whole tract of the smaller intestines was in the same state. The urinary bladder was contracted to the size of a pullet's egg, and its inner coat appeared to have been in a high state of inflammation, the vessels having been distended to such a degree as to have suffered a rupture, and to have effused a quantity of blood into the cavity of this organ.

The state of the lungs in this subject was probably the consequence chiefly of a previous disease, independent of that which proved fatal. An affection of the lungs had some time existed, whilst the subject was, in other respects, in tolerable health, and in the pursuit of his business; so that a pulmonary consumption would, in all probability, have shortly put a period to his life had the disease of which he died never overtaken him.

The third case. In this instance the disease terminated fatally on the fourth day.

Upon opening the thorax, the lungs discovered marks of inflammation, anteriorly, and were extremely gorged with blood, in the posterior part of their respective lobes.

The liver exhibited marks of inflammation, especially on its concave side and posterior part; its texture was altered, and of a very dense consistence. The gall-bladder was completely obliterated, its coats having coalesced with the contiguous parts, so as to form with them one confused membranous substance.—The stomach was externally, to appearance, in a natural state, but its inner coat was covered with that black coloured fluid, denominated the black vomit.

The colon in some parts had been much inflamed, as well as part of the omentum, which was attached to this intestine.

It is worthy of remark, that in both the cases where the gall-bladder had been diseased, and ceased to perform its functions, or if the liver had been rendered incapable of secreting the bile, the body became yellow before death: whereas, in the other, where the bile was found in due quantity, this circumstance did not occur.

From the above dissections, which evinced a deficiency of secretion in the biliary organs, the indications of cure seemed to be directed towards a course, which might obviate the inflammation in general of the organs diseased, and open the excretory ducts of the liver, that the fluid might resume its course into the intestines.

It is with the highest degree of pleasure that we communicate to the public our hopes, that after proper evacuations, the use of calomel may be found to answer these important purposes. This medicine has been accordingly used with much success in fifteen patients within eighteen days, all of whom, excepting one, have recovered, or have past the dangerous period. It has been given not in the usual doses, for the purpose of an evacuant by the intestines, but in small doses, of one, two, or three grains, every hour or two, so as to produce a salivation as soon as possible; with this view, from one hundred to two hundred and thirty grains of calomel have been given in the course of three or four days, commencing the use of it immediately after the first copious evacuations by bleeding and purging; and, in every instance, as the salivation came on, the disease abated.

Coinciding in sentiment respecting the use of mercury, so as to produce a salivation, we with pleasure mention the learned Dr. Rush of Philadelphia. But the method is more explicitly and highly recommended by James Clark, M. D. F. R. S. E. in a treatise on the Yellow Fever, as it appeared in the island of Dominica, in the years 1790, 94, 95, and 96.

The Doctor recommends the free use of mercury, both as a remedy and preventative—and says, “the officers of the army and navy, who have leisure and can be prevailed upon, on their arrival in the West-Indies, to undergo one or two courses of mercury, take a few laxative medicines, after confining themselves to a moderate use of wine, and living chiefly on vegetables and fruits for the first two months after their arrival, may rely, almost to a certainty, on escaping the fever.”

ISAAC RAND.

JOHN WARREN.

## ARTICLE IV.

*On the Effects of Oil in Cases of the Bite of Serpents; republished from the Charleston (South-Carolina) City Gazette.*

Messrs. FRENEAU and PAINE,

I READ with pleasure, in your paper of the 21st of November, "some short directions for the cure of the plague," composed from a small pamphlet lately published by Count Berchtold at Vienna, by the use of *sweet olive oil*.

To take off the sharp edge of misfortune, or to meliorate the condition of man, is a godlike employment. Count Berchtold will be deservedly classed by the philanthropist, among the benefactors to mankind.

In great cities, particularly in London, a number of persons procure their livelihood by catching vipers. They are employed by chemists, apothecaries, &c.

I remember, some years before leaving England, to have read, in the Philosophical Transactions of the Royal Society in London, a curious circumstance relative to one of these viper-catchers.

A member of the society had received, casually, information, that a man engaged in this business was frequently bitten, and that he cured himself by *sweet olive oil*. After considerable inquiry, the viper-catcher was found, and the questions asked, whether he did cure himself by the oil? and whether he was willing to gratify a number of gentlemen of the fact? The man answered affirmatively to both questions. Accordingly, a most numerous meeting of the Royal Society was convened, composed of a considerable number of the nobility, &c. The viper-catcher attended, accompanied by his wife, with a large viper, and laying his arm naked to the shoulder, suffered the irritated reptile to strike, which it did very forcibly. His wife permitted the poison to operate till her husband's head, face, and tongue were greatly swelled, his arm and face also very black, and his senses much affected, when he applied the oil, by pouring a small quantity down and bathing the part bitten. The man gradually and soon recovered.

This circumstance being strongly impressed upon my mind, and knowing that the poison of an English viper is considered in that country the most subtle in nature, determined me to try its antidotal power in the bite of the rattle-snake, the first opportunity which should offer, on my retirement from Charleston to the back country, now Pendleton County. I was also particularly impelled to make the trial, from a consideration of the newness and wiliness of the country, and the number of my family, beside



which there were hardly a dozen more in the country. This was in the year 1786.

In about a month after my arrival, a person in full speed came to my camp, and most urgently begged to know if I could assist a man who had just been bitten by a very large rattle-snake. Although I lamented the misfortune, I rejoiced at the opportunity it offered to ascertain fully the property of olive oil as an antidote to this deadly poison; accordingly I put a phial of oil in my pocket, and mounted the messenger's horse.

When I arrived at the unfortunate man's cabin, he struck me as the most frightful object I had ever beheld. His head and face were prodigiously swelled, the latter black; his tongue proportionably enlarged, and out of his mouth: his eyes as if shooting from their sockets; his senses gone, and every appearance of immediate suffocation. He had been struck on the side of the foot, about the middle, in the hollow.

Immediately, but with great difficulty, I got down two table-spoons full of oil. Its effect was almost instantaneous, and astonishingly powerful in counteracting the poison, as appeared by the strong though quick convulsions that followed. In about 30 minutes it operated strongly, both emetically and cathartically; after which the swelling of the head, face, &c. gradually abated, and the tongue began to assume its place. In about two hours he was so far recovered as to be able to articulate, and from that time recovered fast. The oil, inwardly taken, and applied to the foot and leg, both exceedingly swelled, did not exceed seven or eight spoons full.

The number of cases, of a like nature, in the course of twelve years, has been considerable; in all which, olive oil has proved itself to be peculiarly adapted, and fully adequate to the worst of cases, if timely applied. It is a remedy which every person may command (may have at hand when others cannot be procured) and ought not to be without: indeed, many cautious people here carry a small phial of oil constantly about them. It has also been used with equal success when horses, cattle, and dogs have been bitten. Thus is the mind relieved from terror in those whose occupation subjects them to the bite of the snakes, from a well grounded confidence in the certain efficacy of the oil, and to which every one may have instant recurrence.

The case, I am informed, has occurred, where the oil succeeded, when given to a woman bitten by a mad dog, under strong symptoms of hydrophobia—but at present, I am not sufficiently in possession of particulars to warrant its communication.

I can hardly excuse myself of criminal neglect in having so long omitted to make thus public this sovereign antidote to the worst of animal poisons. The knowledge of the efficacy of the

olive oil is abundantly diffused in this county, and partially in some of the adjoining counties.

The insertion of the foregoing particulars in your City and Carolina Gazettes, must make its invaluable properties generally known.

With great esteem, I am, &c.

Pendleton County, July 4, 1798.

J. MILLER.

## FOREIGN.

### ARTICLE I.

*The following important Account of a new Publication in Great-Britain, by Dr. JENNER, entitled "An Inquiry into the Causes and Effects of the Variolæ Vaccinæ, or Cow Pox," is extracted from the Analytical Review for July, 1798.*

THE author of this inquiry observes, that the cow pox has been long known to farmers in the west of England: but its origin and effects have not been, till of late, properly ascertained. The disease appears on the nipples of cows, in the form of irregular pustules, which are, at first, of a pale blue, or somewhat livid colour, and surrounded by an extensive border of inflammation. These pustules often terminate in phagedenic ulcers, which prove extremely troublesome. The animals become feverish; and the secretion of milk is lessened. Domestics employed in milking the cows are presently affected about the joints, and at the extremities of the fingers, and sometimes on the wrists, with small vesications, or pustules. These enlarge, and suppurate quickly: they appear of a bluish colour, and have always a circular form, their edges being more elevated than their centres. Tumors arise in the axillæ; after which a considerable disorder of the constitution takes place for one, two, three, or four days, and is succeeded by ulcerations on the hands, very difficult to heal, and often phagedenic. Sores are likewise produced on the lips, nostrils, eyelids, &c. from carelessly rubbing these parts with the infected fingers.

Dr. Jenner is of opinion, that the cow pox is not generated by any previous disease of the cow, but that it originates from another animal in a diseased state. The supposed mode of its communication will be most properly delivered in the author's own words:

"In this dairy country a great number of cows are kept, and the office of milking is performed indiscriminately by men, and

maid servants. One of the former having been appointed to apply dressings to the heels of a *horse* affected with the *grease*, and not paying due attention to cleanliness, incautiously bears his part in milking the cows with some particles of the infectious matter adhering to his fingers. When this is the case, it commonly happens that a disease is communicated to the cows, and from the cows to the dairy maids, which spreads through the farm until most of the cattle and domestics feel its unpleasant consequences."

The circumstance which principally demands attention, in regard to the cow pox, is, that any person who has been once affected with it will never afterwards take the small pox, either by exposure to variolous effluvia, or by inoculation. This point, as well as the truth of his idea, respecting the origin of the disease, the author has endeavoured to establish by a variety of cases and experiments.

It appears farther, that those who have had the small pox, either escape the cow pox, or are disposed to take it slightly: thus, by milking infected cows they may get sores on the hand, without being sensible of any general disorder. Dr. Jenner, however, allows, that the cow pox does affect the same individual repeatedly: but he observes, that the second and third attacks are, in general, much more slight than the first.

Some other remarks or inferences, made by the author from his cases and experiments, deserve to be noticed.

1. He says, "One instance has occurred to me of the system being affected by the matter issuing from the heels of horses, and of its remaining afterwards unsuceptible of the variolous contagion; another, where the small pox appeared obscurely; and a third, in which its complete existence was positively ascertained. In order, therefore, effectually to shield the constitution from the small pox, it is necessary that a disease be generated by the morbid matter from the horse on the nipple of the cow, and passed through that medium to the human subject.

"2. When the cow pox was inoculated, pain in the axillæ, and febrile symptoms commenced on the 6th and 7th day after inoculation, and continued till the 10th. The appearances of the incisions, in their progress to a state of maturation, were much the same as when produced, in a similar manner, by variolous matter. The only observable variation consists in this, that the fluid of the cow pox remains limpid nearly to the time of its total disappearance, and never becomes purulent, as in the direct small pox.

"3. A child of five years old was inoculated with matter taken from the hand of one of the servants who had been infected by washing a mare's sore heels. He became feverish on the 6th day; but on the 8th was free from indisposition. Although the pustule

somewhat resembled a small pox pustule, yet its similitude was not so conspicuous as when excited by matter from the nipple of a cow, or by matter which had passed from thence through the medium of the human subject."

Dr. Jenner had not an opportunity of inoculating the same child for the small pox. "It, therefore, remains to be decided whether the matter of *grease*, passing immediately through the human constitution, will secure it afterwards from variolous infection.

"Three men, who washed the mare's heels, were, in consequence, affected with sores in their hands, followed by inflamed lymphatic glands in the arms and axillæ, shiverings, succeeded by heat, lassitude, and general pains in the limbs: but the disease terminated by a single paroxysm.

"4. Several children and adults were inoculated from the arm of a boy, to whom the disease had been transferred from a child five years and a half old, previously inoculated with matter taken from the nipple of an infected cow. The greater part of them sickened on the 6th day, and were well on the 7th; but in three of the number a secondary indisposition arose, in consequence of an extensive erysipelatous inflammation, which appeared on the inoculated arms; and which seemed to arise from an enlarged, painful state of the pustule. This complaint was relieved by the application of mercurial ointment to the inflamed parts.

"5. From the arm of one of the above patients four other children were inoculated. One did not take the infection. The arms of the rest inflamed, with the usual attendant symptoms. In order to prevent the diffuse, painful inflammation, a little mild caustic, made with equal parts of quick-lime and soap, was applied on the vesicle formed by the virus, and suffered to remain on it for six hours. This application answered the purpose, and gave the children no uneasiness. Moreover, within an hour afterwards the febrile symptoms ceased.

"6. Three of the children, thus inoculated, were, sometime afterward, inoculated with active, variolous matter: but the inflammation round the incisions subsided on the fourth day, and was scarcely perceptible on the sixth. No symptom of indisposition followed.

"The above experiments prove, that the matter, in passing from one human subject to another, through five gradations, had lost none of its original properties."

In some general observations, subjoined to the cases, Dr. Jenner offers several hints to the consideration of the inoculators of the small pox; and prosecutes farther the proper subject of his inquiry. He thinks, "the disease is produced only by the thin darkish-looking fluid oozing from the newly-formed cracks in the heels of horses, which is similar to the fluid discharged from

erysipelatous blisters." Pus, taken from old sores, seems to produce simple "inflammation," but not the cow pox. "The activity of the virus is much increased after it has acted on the nipples of the cow; for the horse very seldom affects his dresser with sores, whereas infected cows almost always convey their disease to the milk-maids." Dr. Jenner likewise thinks it probable, "that not only the heels of the horse, but other parts of the body of that animal, are capable of generating the virus which produces the cow pox."

With regard to the origin of the small pox, Dr. Jenner queries, "May it not be reasonably conjectured, that the source of the small pox is morbid matter of a peculiar kind, generated by a disease in the horse; and that accidental circumstances may have, again and again, arisen, still working new changes upon it, until it has acquired the contagious and malignant form, under which we now commonly see it making its devastations among us? May we not also conceive, that many other contagious diseases owe their present appearance not to a simple, but to a compound origin?"

Lastly, Dr. Jenner proposes to substitute the inoculation of the cow pox in the place of that of the small pox. "Inoculation of the small pox," he observes, "often produces deformity of the skin; and always creates a painful solicitude, especially in families predisposed to take the disease unfavourably. Its effect is uncertain, as to the number of pustules which may be produced; and their excess is what we chiefly dread in the small pox. In constitutions disposed to scrophula, the inoculated small pox, however mild, frequently rouses into activity that distressful malady."

The advantages of inoculating the cow pox, instead of the small pox, are stated nearly as follows:

"1. It clearly appears that the former process would leave the constitution in a state of perfect security from the infection of the small pox.

"2. In the cow pox no eruption of pustules takes place over the body.

"3. The disease, when received, cannot be communicated to other persons by effluvia; nor, perhaps, by simple contact, unless there be some abrasion of the cuticle.

"4. No fatal effects have ever been known to arise from the cow pox, even when impressed in the most unfavourable manner, so as to produce extensive inflammations and suppurations on the hands."